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SEATIDE ANALYSIS PROCESS. VOLUME III E. CRUISE MISSILE - CONCEPT(U)
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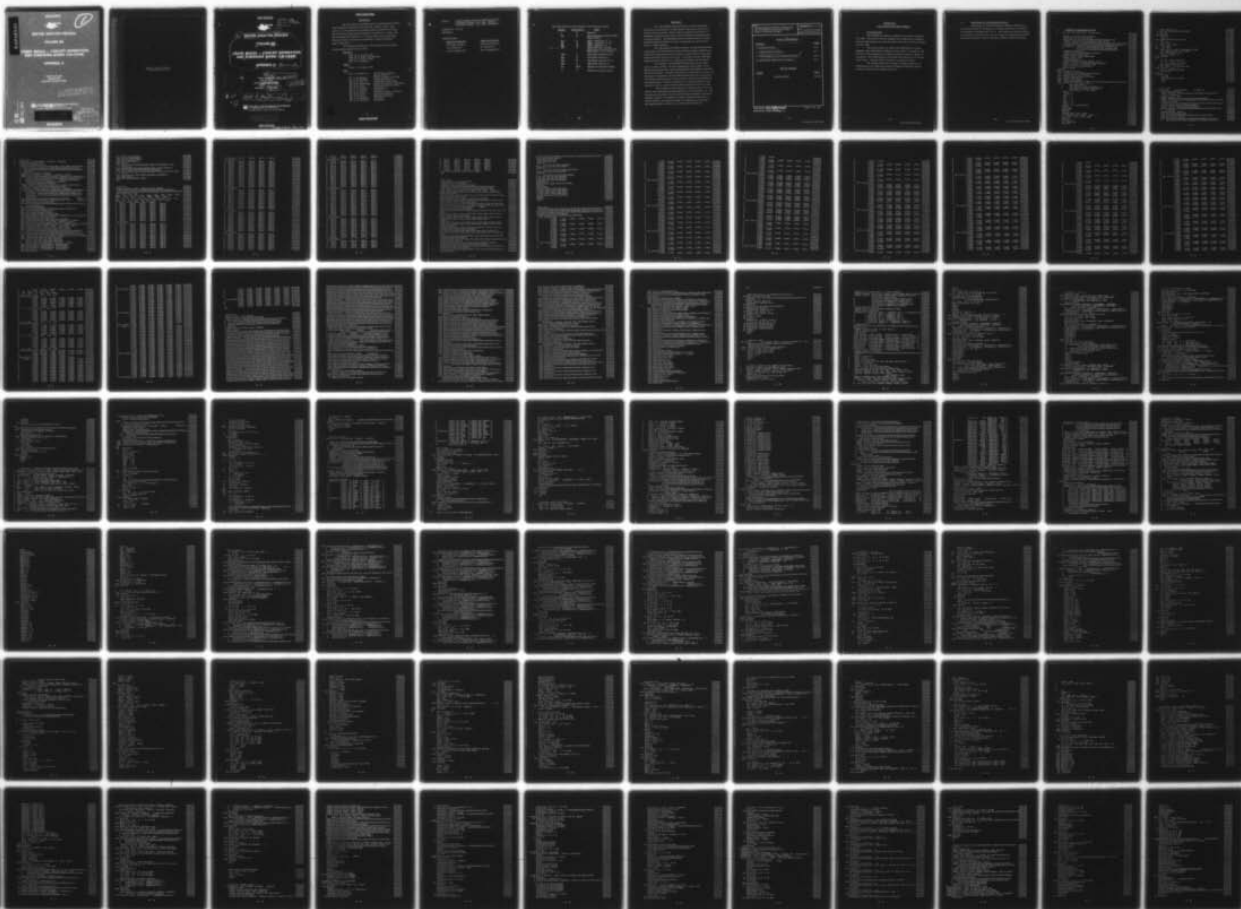
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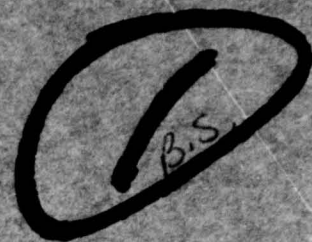
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SEATIDE ANALYSIS PROCESS

VOLUME III

CRUISE MISSILE — CONCEPT GENERATION AND SCREENING MODEL (CM-CGSM)

APPENDIX H

REPORT NO. 00.1636
JANUARY 1974
(CONTRACT DAAB09-72-C-0062)

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VOLUME III.

CRUISE MISSILE - CONCEPT GENERATION AND SCREENING MODEL (CM-CGSM).

APPENDIX H. Revision A,

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FOREWORD

(U) This report was prepared by the Vought Systems Division, LTV Aerospace Corporation, P.O. Box 6267, Dallas, Texas 75222 under U. S. Army Electronics Command Contract DAAB09-72-C-0062. The work was initiated under the direction of Captain R. A. Dowd, USN and completed under Captain W. A. Greene, USN, Chief, Long Range Forecast Division, Directorate of Estimates, Defense Intelligence Agency (DIA-DE-1).

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TITLE: CRUISE MISSILE CONCEPT GENERATION AND
SCREENING MODEL (CM-CGSM) - SOURCE
PROGRAM LISTING - VOL. III, APPENDIX H

REPORT NO. 00.1636

REVISION A

INSTRUCTIONS:

Pages to be removed:

Title page through iv

H-1 through H-3

H-473 through H-479

Pages to be inserted:

Title page through iv

H-1 through H-3

HA-1 through HA-317

(U) This report has been prepared in the following volumes:

<u>Volume</u>	<u>Classification</u>	<u>Title</u>
I	S	Summary
IIA	U	Naval Engagement Model (NEM) - Users Manual
IIB	U	NEM - Appendices A - I
IIC	S	NEM - Appendices J - M
IID	U	NEM - Appendix N
Ad 48343 IIIA	U	Cruise Missile - Concept Generation and Screening Model (CM-CGSM) - Users Manual
IIIB	U	CM-CGSM Appendices A-B
IIC	S	CM-CGSM Appendix C
IID	U	CM-CGSM Appendices D-G
IIIE	U	CM-CGSM Appendix H
IV	S U	Relative Worth Model (RWM)
V	U	Relative Cost Model (RCM)

ABSTRACT

(U) The SEATIDE Analysis Process is a semi-automated procedure for the generation of time-phased, high value cruise missile weapon systems concepts, together with the supporting technology and intelligence indicators which would reflect that these technological goals are being achieved. The SEATIDE process can also be used to evaluate the effectiveness of fixed force levels, existing forces in SAL environments, or Naval defenses.

(U) The Defense Intelligence Agency, through its Directorate of Estimates, and The Advanced Research Projects Agency (ARPA) have sponsored the development of this computer based analysis at the weapon system and Naval force structure level. A previous process, RIPTIDE, was developed for DIA for use in analysis of strategic missile systems.

(U) Generic to the SEATIDE Analysis Process are three major computer models: The Naval Engagement Model (NEM), Cruise Missile Concept Generation and Screening Model (CM-CGSM) and Relative Worth Model (RWM). The NEM evaluates force effectiveness, tactics, and task force configurations; the CM-CGSM enables definition and selection of candidate, advanced cruise missile system concepts; and the RWM permits assessment of worth in accordance with a variety of objective and subjective criteria. Each of these models has been checked out by DIA.

(U) In addition to exercising the computer models, there are several other analytical and engineering tasks to be performed, e.g., the identification of areas of current interest and the associated criteria and potential concepts, the creation of a foreign technology data bank in a format needed by the computer models, the engineering of concepts to the required detail, and the use of a verification analysis loop.

TITLE CRUISE MISSILE CONCEPT GENERATION AND SCREENING MODEL (CM-CGSM) - SOURCE PROGRAM LISTING	<u>Appendix H</u>
	NO. _____
	DATE <u>20 February 1975</u>

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PREPARED BY R.K. McDonough
 APPROVED BY L.D. Gregory

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APPENDIX H
CGSM SOURCE PROGRAM LISTING

1. INTRODUCTION

This appendix presents the complete source program listing of the CGSM. Data and Job Control Language cards required for compilation and use of this program have been discussed in the body of the Users Manual (see Vol. IIE).

The source program is coded in the FORTRAN IV Computer language. Each subprogram is labeled in card columns 73 through 76, and each card in the subprogram is assigned a sequence number in columns 77 through 80. The CGSM includes 193 modules, and consists of over 28,000 source cards. An index of those modules is contained in Table 1.

The original CGSM source listing is included as Section 2.0. Modifications to the CGSM made during the Enhanced SEATIDE contract period are reflected in the listing of Section 4.

DISCUSSION OF CGSM MODIFICATIONS

Modifications to the CGSM during the Enhanced SEATIDE contract period include I/O refinements, screening refinements, and addition of the Relative Cost Model (see Vol. V). All modules are marked in Table 1 by an asterisk. Modules which were not changed during Enhanced SEATIDE are listed in Section 2.0 and are tabulated in Table 1 without an asterisk.

4. MODIFIED CGSM SOURCE LISTING

C	CM-CGSM MAIN SUBROUTINE	29 JAN 1975	CM-C0010
C			CM-C0020
	DEFINE FILE 11(160,175,U,JD11)		CM-C0030
	DEFINE FILE 12(500,300,U,JD12)		CM-C0040
	COMMON/DEVICE/ N1,N2,N3,N4,N5,N6,N7,N8,N9,N10,N11,N12		CM-C0050
	INTEGER ZIP,ZCODE,Z1,Z2,Z3,Z4,Z5,Z6,Z7,Z8,Z9		CM-C0060
	COMMON/INOUT/NLINE,NPAGE,PCODE(20),MISC(7),XMISC(7),ZIP,ZCODE(19)		CM-C0070
	1, JRASH(20),TRASH(20),IR(8),IC(8),DUM(8),IDUM(8),NFLAG,NFLAG2		CM-C0080
	EQUIVALENCE (ZCODE(1),Z1),(ZCODE(2),Z2),(ZCODE(3),Z3)		CM-C0090
	1 , (ZCODE(4),Z4),(ZCODE(5),Z5),(ZCODE(6),Z6)		CM-C0100
	2 , (ZCODE(7),Z7),(ZCODE(8),Z8),(ZCODE(9),Z9)		CM-C0110
	COMMON/SECTION/CLAS(20)		CM-C0120
	COMMON/INOUT/IPR(16),JPAR(16),PAR(16)		CM-C0130
	COMMON/FASTAB/KZARL,KZARS		CM-C0140
	COMMON/FILING/ KONPL,KSAVPL,KEND		CM-C0150
	COMMON /INOUT/ LABEL		CM-C0160
	COMMON/INOUT4/JD4		CM-C0170
C	COMMON/INOUT5/JD5,ND9,NB9,INDX9(10,6)		CM-C0180
	COMMON /INOUT11/ JD11,ND11,NB11,INDX11(100,7)		CM-C0190
	COMMON / INOUT12 / JD12,ND12, NB12		CM-C0200
	COMMON /NFILES/ N55, NFILZ(5)		CM-C0210
	DATA BLANK/4F /		CM-C0220
			CM-C0230
CEFORMATS			CM-C0240
1000	FORMAT(1X,19A4,A3)		CM-C0250
2000	FORMAT(1H1,71X, 4HPAGE,14/6X,19A4,A3)		CM-C0260
1002	FORMAT(A4,3I2,I10,4I5,10A4)		CM-C0270
2002	FORMAT(/6X,A4,3I2,I10,4I5,10A4)		CM-C0280
1003	FORMAT (10X,7G10.3)		CM-C0290
2003	FORMAT (10X,7G13.6)		CM-C0300
2005	FORMAT(1H0,20HERROR IN MAIN AT E1=F8.2,3X,A4,3I2,I10,4I5,10A4)		CM-C0310
2006	FORMAT(//////////44X, 4HNUK //		CM-C0320
1	44X, 7HCM-CGSM//		CM-C0330
2	35X,'VOUGHT SYSTEMS DIVISION', //		CM-C0340
3	34X,25HLTV AFROSPACE CORPORATION //		CM-C0350
4	37X,19HDALLAS, TEXAS 75222)		CM-C0360
	NFLAG = 0		CM-C0370
	NFLAG2= 0		CM-C0380
	ND11 = 1		CM-C0390
	NB11 = 0		CM-C0400
	ND9 = 1		CM-C0410
	NB9 = 0		CM-C0420
	LAA1 = 31		CM-C0430
	MAA1 = 12		CM-C0440
	KZARL= 96 + LAA1*(5+MAA1)		CM-C0450
	KONPL=0		CM-C0460
	KSAVPL=500		CM-C0470
	KEND=500		CM-C0480
	IMAGE=1		CM-C0490
	READ(N5,1000) CLAS, PCODE		CM-C0500
	IF (PCODE(1) .EQ. BLANK) IMAGE = 0		CM-C0510
	IF (IMAGE .EQ. C) GO TO 380		CM-C0520
	NPAGE=1		CM-C0530
	CALL PAGE		CM-C0540
	WRITE(N6,2006)		CM-C0550
	CALL PAGE		

C	CARD IMAGE PRINT	CM-C0560
38	CALL CARD(N5,N6,N9,CLAS,PCODE)	CM-C0570
	N5 = N9	CM-C0580
380	CONTINUE	CM-C0590
	N55 = N5	CM-C0600
1	NPAGE = 1	CM-C0610
101	READ (N5,1000)CLAS, PCODE	CM-C0620
	NIT = 0	CM-C0630
2	CALL PAGE	CM-C0640
	WRITE (N6, 2006)	CM-C0650
900	CALL PAGE	CM-C0660
902	E1 = 902.	CM-C0670
	READ (N5,1002, END= 10,ERR=9021) ZCODE	CM-C0680
	IF (IPR(1).EQ.0) GO TO 9022	CM-C0690
	WRITE (N6,2002) ZCODE	CM-C0700
	NLINE = NLINE + 2	CM-C0710
9022	CONTINUE	CM-C0720
C**		CM-C0730
	IF (Z2 .EQ.1) GO TO 1	CM-C0740
	IF (Z2 .EQ.2) GO TO 2	CM-C0750
	IF (Z2 .EQ.10) GO TO 10	CM-C0760
	CALL CMGSM (NIT, KRET)	CM-C0770
14	IF (KRET - 1) 900, 900, 902	CM-C0780
9021	NFLAG = NFLAG + 1	CM-C0790
	WRITE (N6,2005) E1,ZCODE	CM-C0800
	GO TO 902	CM-C0810
C**STOP		CM-C0820
10	CONTINUE	CM-C0830
	CALL PAGE	CM-C0840
	WRITE(N6,2003) ND9,NB9	CM-C0850
	STOP	CM-C0860
	END	CM-C0870

	BLOCK DATA	DATA0010
C	NU6,CM-CGSM R.K.MCDONOUGH 28 MARCH 73	DATA0020
	COMMON/DEVICE/ND(12)	DATA0030
	COMMON /SCRNNL/ NPTS(20),PARVNL(7,20),DWNL(7,20),DUMMY(50)	DATA0040
1	,NSCOST,IDU4M4(4)	DATA0050
	COMMON /INQUU/ LARFL	DATA0060
	COMMON /CONSTA/ RE,TWOPI,GM,PI,RAD,FPM,RENM,WE	DATA0070
	COMMON /SCREEN/NLEVEL,LWF1,LWF2,LDES,NDES,LPERF,NPERF,LSAV,NSAV	DATA0080
	INTEGER ZIP,ZCODE	DATA0090
	COMMON/INOUT/NLINE,NPAGE,P(20),MISC(7),XMISC(7),ZIP,ZCODE(19) ,	DATA0100
1	JR(20),TR(20),IRC(16),DUM(8),IDUM(10)	DATA0110
	COMMON /INQU1/ JPR(16),JPAR(16),PAR(16)	DATA0120
	COMMON /SWORTH/ KBASE,W2(2),NPAR,KPAR(20),PARV(20),DERV1(20),	DATA0130
1	DERV2(20)	DATA0140
	COMMON /NFILES/ NUKY(6)	DATA0150
	DATA NSCOST, IDU4M4/1,4*0/	DATA0160
	DATA NPTS,PARVNL,DWNL,DUMMY/20*0,140*0.,140*0.,50*0./	DATA0170
	DATA NUKY/5,6,7,11,12,1/	DATA0180
	DATA RE,FPM,RAD,RENM,WE,PI,TWOPI,GM/20925688.,6076.1155,	DATA0190
1	57.2957795,3443.9253,.004178075,3.14159265,6.2831853,	DATA0200

2	1.40765E16/	DATA0210
	DATA KBASE,W2/0,2*100./	DATA0220
	DATA NLEVEL,LWF1,LWF2,LDES,NDFS,LPERF,NPERF,LSAV,ASAV/10,100,0,	DATA0230
1	1,10,1,10,10,100/	DATA0240
	DATA PARV,DERV1,CERV2,KPAR,NPAR/60*0.,20*0,11/	DATA0250
	DATA XMISC,MISC/ 7*0., 7*0/	DATA0260
	DATA ND/1,2,3,4,5,6,7,8,9,10,11,12/	DATA0270
	DATA IPR/1,2,1,1,0,11*1/	DATA0280
	DATA JPAR/16*1/	DATA0290
	DATA PAR/16*1.0/	DATA0300
	DATA LABEL/ 1/	DATA0310
	END	DATA0320

	BLOCK DATA	DATA0010
	COMMON /AERO/ X91(93),SLET, X10(10), BRAX, XXZ7	DATA0020
	COMMON /AERPRO/ CDDDES(10), CLADES(10)	DATA0030
	COMMON /AERZ/ AERZ9(9), FRBTX, FRB, NAERO(30)	DATA0040
	COMMON /ALFBLK/ AMACH, A, ALT, GAMRAD, ACCN, ACCT, CDC, C, SREF,	DATA0050
1	ACWT, ALPHA, CFNREQ, DEG, CLALFD	DATA0060
	COMMON /DRG/ XAZ2(2),FINE,XAZ7(7),ITX,AM5(5),IRTL,AZMZ3(3),	DATA0070
1	ITSECT,IWSECT,RXINT,RXINW,ARV9(9),DE,UMPT(2),NW,74(4),	DATA0080
2	ART,ARW,TRT,TRW,ZSXC2(2)	DATA0090
	COMMON /FORNO/ NRM,NALT,RMV(20),ALTV(10),FRBT,FACTCR	DATA0100
	COMMON /LET/ SET3(3),SET,SET2(2),RL4,RL5,SFF2(2),IARX,	DATA0110
1	ICNTRL,XZ2X(2)	DATA0120
	COMMON /NAERO/ TNAZZL	DATA0130
P	,STE,STET,TRAT,SWE,TRAW,DCA SE,DEOD,ARL6,AL5X,XMSX,	DATA0140
Q	STEW, XSTA,FSDVCW,FSDVCT,WMISS,SMPL,SMRH,WWINX,IARWX,	DATA0150
R	IPLDT,NOGVAR	DATA0160
S	,THNGL,TNOZL,TLTHEO	DATA0170
	COMMON /ROLL/ RNW,RNQ,IARWQ,BWH,BTH	DATA0180
	COMMON /SEVEN/ ITN,APHI,CLR,IARADAR,IPAY,DANT,XLVOID,WFEQ,WMISC,	DATA0190
1	RHOWH,PHOEQ,FQCLR,WHCLR,XLMISC,XLEQ,XLWH,	DATA0200
2	IART,NW,IARW,PIVOT,INTYPE,XLPAYI,WPAYI,WWH,XLEHT,	DATA0210
3	XLEW,XLEVT,XLET,EXTRSV(25)	DATA0220
	COMMON /SURFX/ RMDDES,WDG,GUIT,IWTS,WWINGI,WTI,WQVAW,WQVAHT,	DATA0230
1	WQVAVT,WQVAT,WW3(3),VTALOC,WW5(5)	DATA0240
2	,SLEW,SLEVT,ISUREW,IPLANW,ISURFT,IPLANT	DATA0250
	COMMON /UPINLT/ PRAMB(129),XCGD1	DATA0260
	COMMON/XINFRT/ XPROP,DELTAN,RL3,XPAY,XMOTOR,WARRAY,XA,PANWW,	DATA0270
	IPW,CRW,CTW,NPANEL,PANWHT,CRHT,CTHT,RNT,BZ,PANWVT,CRVT,CTVT,	DATA0280
	2BVT,R1,IZRT,CRT,CTT,WINL,WRST,XBST,YBST,ZBST,XINL,YINL,ZINL,	DATA0290
	3XW,YW,ZW,XVT,YVT,ZVT,XHT,YHT,ZHT,IZN,IRST,XT,YT,ZT,	DATA0300
4	PARRAY, XIXINL,XIYINL,XIZINL,XIXBST,XIYBST,XIZBST,CL,	DATA0310
	7RL1,WM,WVT,WWING,WHT,PANWT,XTANK,BRAT,THETAC,XCYL,XBT,DANZ	DATA0320
8	XPROP1,XPROP2,XPROP3,XPROP4,WPROP1,WPROP2,WPROP3,WPROP4	DATA0330
	DIMENSION WARRAY(20),XA(20),PARRAY(20)	DATA0340
	EQUIVALENCE (X91(18),CLAT), (Z4(3),BT)	DATA0350
	EQUIVALENCE (X91(58),XD1T)	DATA0360
	COMMON /TUR/ BCLR,CLRA,CLRF,DEL VX,FCLR,GCLR,KMAIR,	DATA0370
1	PAKSUR,RATCLR,REHTUR,THEAD,THEST,TURTHK,	DATA0380
2	KMTAIL,WINGCL,WTMAX,XLTMAX,DTUBMX,XLTBMX,ZPYLCN	DATA0390
C	FOR PACKAGING SUBMODEL	DATA0400

DATA BCLR,CLRA,CLRF,DEL VX/1.,3*6./	DATA0410
DATA FCLR,GCLR,KMAIR,PAKSUB/60.,12.,2,0./	DATA0420
DATA RATCLR,REHTUB,THEAD,THEBST/2.,2.,4.,40./	DATA0430
DATA TURTPK,KMTA IL,WINGCL,WTMAX/4.,2,90.,20000./	DATA0440
DATA XL TMAX,DTURMX,XLTBMX,ZPYLON/500.,50.,500.,18./	DATA0450
DATA CDDDES,CLADES/0.12,9*0.,0.12,9*0./	DATA0460
DATA XDIT/9.5/	DATA0470
DATA NAERO/ 2, 0, 0, 0, 1, 4, 0, 0, 0, 1, 1, 0, 0, 0, 1, 15*0/	DATA0480
DATA XCGD1,CLAT,RT,SET/5.,.0515,24.,234./	DATA0490
DATA CDD,CLALFD/0.18, 0.17/	DATA0500
DATA XIXINL, XIYINL, XIZINL, XIXBST, XIYBST, XIZBST,IBST/	DATA0510
1 1520., 56045., 56045., 8810., 605000., 605000.,0/	DATA0520
DATA XPROP1, XPROP2, XPROP3, XPROP4, WPROP1, WPROP2, WPROP3,	DATA0530
1 WPROP4/ 21.15, 4.0,22.0,22.0, 146., 46., 192., 192./	DATA0540
DATA RL1, WM,WVT,WWING,WHT, XTANK, THETAC,C1,XBT/	DATA0550
1 37.5,1000., 0.0,0.0, 0.0, 21.15, 0.165, 15.,0.0/	DATA0560
DATA XPROP, DELTAN,RL3,XPAY,XMOTOR, BW,CRW,CTW/	DATA0570
1 69.0, 0.0,149.,80.,44.,3*0.0/	DATA0580
DATA NPANEL, PANWHT,CPHT,CTHT,RNT,BT,PANWVT,CRVT,CTVT,BVT/	DATA0590
1 0,25.,0.0,0.0,4.0,24.5,25.,0.0,0.0,0.0/	DATA0600
DATA R1, CRT,CTT,WINL,WBST,XBST,YBST,ZBST/	DATA0610
1 7.5, 15., 4.5, 95.,0.0,0.0, 0.0, 0.0/	DATA0620
DATA XINL,YINL,XW,YW,ZW,XVT,YVT,ZVT,XHT,YHT,ZHT,ZINL/	DATA0630
1 100.,10.,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0,0.0/	DATA0640
DATA XT,YT,ZT,PARRAY, WARRAY/0.0, 0.0, 0.0,20*0.0,20*0.0/	DATA0650
DATA APPI,CLR,IRADAR,IPAY,DANT/ 20.,1.,1,1,11./	DATA0660
DATA XLVOID,WFOQ,WMISC,RHOWH,RHOEQ/27.,92.,125.,.06,.03/	DATA0670
DATA FQCLR,WHCLR,XLMISC,XLEQ,XLWH/1.,1.,2.,29.,22./	DATA0680
DATA PIVOT,INTYPE,XLPAYI,WPAYI,WWH,XLEHT,XLEW,XLEVT,XLET/1.,	DATA0690
1 2,80.,354.,137.,134.,0.,134.,134./	DATA0700
DATA IARW,IART,ICNTPL,ITN,NW,ART,SLET/0,4,1,2,0,2.57,38./	DATA0710
DATA ITSECT,IWSECT/1,1/	DATA0720
DATA IARX,NWX,BRAX,ITX/4,0,0.,2/	DATA0730
DATA RTH, RXINT, STE, STET, TRT, TRAT, BWH, RXINW, SWE/	DATA0740
1 19.75, 0.50, 117., 0.0, 0.32, 0.04, 25.50, 0.50, 0.0/	DATA0750
DATA TRW, TRAW, DCASE, DEOD, DE, THNGL, TNOZL, ARL6, AL5X/	DATA0760
1 0.3, .05, 15.0, 14.50, 14.20, 141.0, 10.0, 113.0, 85.0/	DATA0770
DATA XMSX, BRAT, FINE, TLTHEO, STEW, RL4, RL5, FACTOR/	DATA0780
1 2.40, 0.0, 2.50, 149.0, 0.0, 134.0, 50.0, 0.50/	DATA0790
DATA NRM,RMV/6.,.4.,.9,1.,1.5,2.,4.,14*0./	DATA0800
DATA NALT,ALTV/3,0.,40000.,100000.,7*0./	DATA0810
DATA RNQ,RNW,PANWT,PANWW/4.,2.,20.,40./	DATA0820
DATA XSTA,FPRT,FSOVOW,FSOVCT,WMISS/4*0.,1000./	DATA0830
DATA WWINX,IARWX,RZ/0.,0,24./	DATA0840
DATA SMRL,SMRH/0.,0./	DATA0850
DATA IPLOT,NCGVAR/2*0/	DATA0860
DATA RMDFS,WOG,GULT,IWTS,WTI,WWINGI/2.,1000.,10.,3,25.,50./	DATA0870
DATA WOVAV,WOVAHT,WOVAVT,WOVAT,VTALOC/4*6.,.5/	DATA0880
DATA SLEW,SLEVT/50.,45./	DATA0890
DATA ISURFW,IPLANW,ISURFT,IPLANT/4*1/	DATA0900
DATA IPADAR,CLR,DANT,XLVOID/0,0.,1.,1./	DATA0910
END	DATA0920

	BLOCK DATA	DATA0010
C	NUK.CM-CCSM P.K.MCDONOUGH FIV/EBCD 10/18/73	DATA0020
C	PRESTORE NAMELIST DATA	DATA0030
C	FILL VEHPER COMMON BLOCKS	DATA0040
	COMMON /NEWVPM/ DALPH,DALT,DCFN,DELMAX, DHCL,DMACH,CMIN,DSTART,	DATA0050
C	DVCL,FREF,ERRFAC,IPROP1, JPRINT,MXSTEP,NTRY5,RANGE1,RTOL,	DATA0060
C	TIMEI,GKG,GKV,GKVCRU,GTOPT,SLOPE(20),TPHASE(20),TTOTAL(20),	DATA0070
F	PMOPF(20)	DATA0080
	DIMENSION ZPERF(670), ZTOVP(72)	DATA0090
	EQUIVALENCE (ZPERF(1), KBYPSM), (ZTOVP(1), BODWP)	DATA0100
	COMMON /PERF/ KBYPSM,KBYDRG,VELI,XMACHI,GAMMAI,ALTI,MCPT,NLPHAZ,	DATA0110
1	NCPHAZ,NDPHAZ,XMACHF(20),ALTF(20),GAMMAF(20),FVALUE(20),	DATA0120
2	XPITCH(10,20),YPITCH(10,20), ITERM(20),NAERC(20),	DATA0130
3	IPTYPE(20),MODES(20),MHGEN(20),ICONT(20)	DATA0140
4	, ALPMAX(20),ANZMAX(20),FUSY(20)	DATA0150
	COMMON /TOVPER/ BODWP,BISPV,BTHVAC,BEXIT,SUSWP,SEXIT,BCANTA,	DATA0160
1	WTINT,DROPT,DROPEB,KIND,A5A3,A6A3,ACA3,D3,	DATA0170
2	TVACMX, TVACMN,YISP(20), XTHRTL(20), EXTRA(15)	DATA0180
	COMMON /PYAIR/ SREF,SMACH1(20),SMACH2(20),SMACH3(20),SMACH4(20),	DATA0190
1	SMACH5(20), CLALF1(20),CLALF2(20),CLALF3(20),CLALF4(20),	DATA0200
2	CLALF5(20), DMACH1(20),DMACH2(20),DMACH3(20),DMACH4(20),	DATA0210
3	DMACH5(20), CDD1(20,5),CDD2(20,5),CDD3(20,5),CDD4(20,5),	DATA0220
4	CDD5(20,5)	DATA0230
	DATA BODWP,BISPV,BTHVAC,BEXIT,SUSWP,SEXIT,BCANTA, DROPT,	DATA0240
1	DROPEB/348.4,276.06,37940.,1.4092,550.,0.0,0., 98.6,0./	DATA0250
	DATA A5A3,A6A3,ACA3/.55,.93,.272/	DATA0260
	DATA TVACMX,TVACMN,YISP,XTHRTL/50000.,5000.,0.,276.06,325.,17*0.,	DATA0270
1	0.,.73,1.,17*0./	DATA0280
	DATA KBYPSM,KBYDRG/2*0/	DATA0290
	DATA VELI,XMACHI,GAMMAI,ALTI,MCPT/861.9,.8,0.,10000.,1/	DATA0300
	DATA NLPHAZ,NCPHAZ,NDPHAZ/7,4,2/	DATA0310
	DATA XMACHF/2.4,4*4.,2*2.5,13*0./	DATA0320
	DATA ALTF/10000.,3*80000.,3*500.,13*0./	DATA0330
	DATA GAMMAF/20*0./, NAERC/1,6*2,13*0/, ITERM/6,7,1,4,7,1,4,13*0/	DATA0340
	DATA FVALUE/3*0.,5.,3.,0.,1.,13*0./	DATA0350
	DATA IPTYPE/1,6*4,13*0/, MODES/0,1,0,0,-1,15*0/	DATA0360
	DATA ALPMAX/20.,2*5.,20.,3*5.,13*0./, ANZMAX/10.,3.,18*10./	DATA0370
	DATA ICONT/1,12,14,13,12,14,13,13*0/, MHGEN/0,1,18*0/	DATA0380
	DATA XPITCH/0.,.01,3.5,5.,16*0., 20*0., 0.,1000000.,18*0., 140*0./	DATA0390
	DATA YPITCH/2*0.,2*15.,16*0., 20*0., 2*4.,18*0., 140*0./	DATA0400
	DATA DMACH1/.5,.8,1.,1.1,1.2,1.5,2.,2.5,3.,11*0./	DATA0410
	DATA SMACH1/.5,.8,1.,1.1,1.2,1.5,2.,2.5,3.,11*0./	DATA0420
	DATA CDD1/0.,.157,.245,.4.,.495,.505,.48,.402,.356,.329,10*0.,	DATA0430
1	40000.,.188,.27,.42,.54,.548,.502,.427,.378,.345,70*0./	DATA0440
	DATA CLALF1/.141,.161,.174,.184,.187,.162,.134,.122,.115,11*0./	DATA0450
	DATA SMACH2/1.5,2.,3.,4.,5.,15*0./, DMACH2/1.5,2.,3.,4.,5.,15*0./	DATA0460
	DATA CLALF2/.146,.116,.09,.08,.076,15*0./	DATA0470
	DATA CDD2/0.,.26,.228,.18,.152,.134,14*0.,	DATA0480
1	40000.,.284,.247,.197,.164,.145,14*0.,	DATA0490
2	80000.,.341,.297,.237,.198,.175,14*0., 40*0./	DATA0500
	DATA SMACH3/20*0./, SMACH4/20*0./, SMACH5/20*0./	DATA0510
	DATA DMACH3/20*0./, DMACH4/20*0./, DMACH5/20*0./	DATA0520
	DATA CLALF3/20*0./, CLALF4/20*0./, CLALF5/20*0./	DATA0530
	DATA CDD3/100*0./, CDD4/100*0./, CDD5/100*0./	DATA0540
	DATA SPEF/1.6667/	DATA0550

DATA DMACH1,DMACH2/40*0./	DATA0560
DATA SMACH1,SMACH2/40*0./	DATA0570
DATA CLALF1,CLALF2/40*0./	DATA0580
DATA CDD1,CDD2/200*0./	DATA0590
DATA MDPT/1/	DATA0600
DATA DALPH,DALT,CCFN,DELMAX,DHCL,DMACH/.035,10000.,.1,60.,	DATA0610
1 10000.,.4/	DATA0620
DATA DMIN,DSTART,DVCL,FREF,FRRFAC/.001,.1,100.,.0005,5./	DATA0630
DATA IPROP1,JPRINT,MXSTEP,NTRY5/0,1,2000,10/	DATA0640
DATA RANGE1,RTOL,TIME1,GKG,GKV,GKVCRU,GTOPT/0.,10.,0.,1.,.001,	DATA0650
1 .1,1./	DATA0660
DATA SLOPE,TPHASE,TTOTAL/20*0.,20*10000.,20*10000./	DATA0670
DATA PMORE/20*0./	DATA0680
DATA ZPERF,ZTOVP/670*C.,72*0./	DATA0690
END	DATA0700

BLOCK DATA	DATA0010
COMMON /SOLMIS/ CSTAR1, CSTAR2, ETSISP, DUM7(7)	DATA0020
COMMON/PINSOL/TAISP1(95),TAISP2(80),TAISP3(80),TAISP4(60),	DATA0030
1TAISP5(60),TAISP6(60),TAISP7(80),TAISP8(80),TAISP9(60),TAISPA(60)	DATA0040
DATA TAISP1/1.0, 2.0,	DATA0050
120., 30., 40., 50., 75., 100., 150., 200., 300., 400.,	DATA0060
2500., 750., 1000., 1250., 1500., 1750., 2000.,	DATA0070
34., 6., 8., 10., 12., 14., 16., 18., 20., 25., 30.,	DATA0080
435., 40., 45., 50., 60., 70., 80., 90., 100.,	DATA0090
5 254.6, 266.7, 274.6, 280.5, 286.0,	DATA0100
6 288.9, 292.0, 294.7, 297.0, 301.8,	DATA0110
7 305.4, 308.4, 310.9, 313.0, 314.8,	DATA0120
8 317.9, 320.5, 322.6, 324.4, 325.9,	DATA0130
9 255.6, 267.7, 275.5, 281.4, 286.0,	DATA0140
A 289.8, 292.9, 295.5, 297.9, 302.6,	DATA0150
B 306.2, 309.2, 311.6, 313.8, 315.6,	DATA0160
C 318.7, 321.2, 323.2, 325.0, 326.6,	DATA0170
D 256.3, 268.4, 276.2, 282.0, 289.6,	DATA0180
E 290.4, 293.5, 296.1, 298.4, 303.1,	DATA0190
F 306.8, 309.7, 312.2, 314.3, 316.1,	DATA0200
G 319.2, 321.6, 323.7, 325.5, 327.0/	DATA0210
DATA TAISP2/	DATA0220
1 256.8, 268.9, 276.7, 282.5, 274.9,	DATA0230
2 290.8, 293.9, 296.6, 298.9, 303.6,	DATA0240
3 307.2, 310.1, 312.6, 314.7, 316.5,	DATA0250
4 319.5, 322.0, 324.0, 325.8, 327.3,	DATA0260
5 257.8, 269.8, 277.5, 283.4, 288.0,	DATA0270
6 291.6, 294.7, 297.4, 299.7, 304.3,	DATA0280
7 307.9, 310.8, 313.3, 315.3, 317.1,	DATA0290
8 320.2, 322.6, 324.6, 326.4, 327.9,	DATA0300
9 258.4, 270.4, 278.1, 283.9, 288.5,	DATA0310
A 292.2, 295.2, 297.9, 300.2, 304.8,	DATA0320
B 308.4, 311.3, 313.7, 315.8, 317.6,	DATA0330
C 320.6, 323.0, 325.0, 326.7, 328.3,	DATA0340
D 259.2, 271.3, 278.9, 284.6, 289.2,	DATA0350
E 292.9, 296.0, 298.6, 300.9, 305.5,	DATA0360
F 309.0, 311.9, 314.3, 316.4, 318.2,	DATA0370

G	321.1,	323.5,	325.5,	327.3,	328.7/	DATA0380
	DATA TAISP3/					DATA0390
1	259.8,	271.8,	279.4,	285.2,	289.7,	DATA0400
2	293.4,	296.4,	299.1,	301.3,	306.0,	DATA0410
3	309.5,	312.3,	314.7,	316.8,	318.5,	DATA0420
4	321.5,	323.9,	325.9,	327.6,	329.1,	DATA0430
5	260.6,	272.5,	280.1,	285.8,	290.4,	DATA0440
6	294.0,	297.1,	299.7,	301.9,	306.5,	DATA0450
7	310.0,	312.9,	315.3,	317.3,	319.1,	DATA0460
8	322.0,	324.4,	326.3,	328.0,	329.5,	DATA0470
9	261.1,	273.0,	280.6,	286.3,	290.8,	DATA0480
A	294.5,	297.5,	300.1,	302.4,	306.9,	DATA0490
B	310.4,	313.3,	315.6,	317.6,	319.4,	DATA0500
C	322.3,	324.7,	326.6,	328.3,	329.8,	DATA0510
D	261.5,	273.4,	281.0,	286.5,	291.2,	DATA0520
E	294.8,	297.8,	300.4,	302.7,	307.2,	DATA0530
F	310.7,	313.5,	315.9,	317.9,	319.6,	DATA0540
G	322.5,	324.9,	326.8,	328.5,	330.0/	DATA0550
	DATA TAISP4/					DATA0560
1	262.2,	274.0,	281.6,	287.2,	291.7,	DATA0570
2	295.3,	298.4,	300.9,	303.2,	307.7,	DATA0580
3	311.2,	314.0,	316.3,	318.3,	320.0,	DATA0590
4	322.9,	325.3,	327.2,	328.9,	330.3,	DATA0600
5	262.6,	274.4,	281.9,	287.5,	292.0,	DATA0610
6	295.7,	298.7,	301.3,	303.5,	308.0,	DATA0620
7	311.5,	314.3,	316.6,	318.6,	320.3,	DATA0630
8	323.2,	325.5,	327.4,	329.1,	330.5,	DATA0640
9	262.9,	274.7,	282.1,	287.8,	292.3,	DATA0650
A	295.9,	299.0,	301.5,	303.7,	308.2,	DATA0660
B	311.7,	314.5,	316.8,	318.8,	320.5,	DATA0670
C	323.4,	325.7,	327.6,	329.3,	330.7/	DATA0680
	DATA TAISP5/					DATA0690
1	263.2,	275.0,	282.5,	288.0,	292.5,	DATA0700
2	296.1,	299.1,	301.7,	303.9,	308.4,	DATA0710
3	311.8,	314.6,	317.0,	318.9,	320.6,	DATA0720
4	323.5,	325.8,	327.7,	329.4,	330.8,	DATA0730
5	263.4,	275.2,	282.7,	288.2,	292.7,	DATA0740
6	296.3,	299.3,	301.9,	304.1,	308.5,	DATA0750
7	312.0,	314.8,	317.1,	319.1,	320.8,	DATA0760
8	323.6,	325.9,	327.9,	329.5,	330.9,	DATA0770
9	263.6,	275.3,	282.9,	288.4,	292.8,	DATA0780
A	296.4,	299.4,	302.0,	304.2,	308.7,	DATA0790
B	312.1,	314.9,	317.2,	319.2,	320.9,	DATA0800
C	323.7,	326.0,	327.9,	329.6,	331.0/	DATA0810
	DATA TAISP6/					DATA0820
5	254.6,	266.7,	274.6,	280.5,	276.0,	DATA0830
6	288.9,	292.0,	294.7,	297.0,	301.8,	DATA0840
7	305.4,	308.4,	310.9,	313.0,	314.8,	DATA0850
8	317.9,	320.5,	322.6,	324.4,	325.9,	DATA0860
9	255.6,	267.7,	275.5,	281.4,	286.0,	DATA0870
A	289.8,	292.5,	295.5,	297.9,	302.6,	DATA0880
B	306.2,	309.2,	311.6,	313.8,	315.6,	DATA0890
C	318.7,	321.2,	323.2,	325.0,	326.6,	DATA0900
D	256.3,	268.4,	276.2,	282.0,	289.6,	DATA0910
E	290.4,	293.5,	296.1,	298.4,	303.1,	DATA0920

F	306.8,	309.7,	312.2,	314.3,	316.1,	DATA0930
G	319.2,	321.6,	323.7,	325.5,	327.0/	DATA0940
DATA TAISP7/						DATA0950
1	256.8,	268.9,	276.7,	282.5,	274.9,	DATA0960
2	290.8,	293.9,	296.6,	298.9,	303.6,	DATA0970
3	307.2,	310.1,	312.6,	314.7,	316.5,	DATA0980
4	319.5,	322.0,	324.0,	325.8,	327.3,	DATA0990
5	257.8,	269.8,	277.5,	283.4,	288.0,	DATA1000
6	291.6,	294.7,	297.4,	299.7,	304.3,	DATA1010
7	307.9,	310.8,	313.3,	315.3,	317.1,	DATA1020
8	320.2,	322.6,	324.6,	326.4,	327.9,	DATA1030
9	258.4,	270.4,	278.1,	283.9,	288.5,	DATA1040
A	292.2,	295.2,	297.9,	300.2,	304.8,	DATA1050
B	308.4,	311.3,	313.7,	315.8,	317.6,	DATA1060
C	320.6,	323.0,	325.0,	326.7,	328.3,	DATA1070
D	259.2,	271.3,	278.9,	284.6,	289.2,	DATA1080
E	292.9,	296.0,	298.6,	300.9,	305.5,	DATA1090
F	309.0,	311.9,	314.3,	316.4,	318.2,	DATA1100
G	321.1,	323.5,	325.5,	327.3,	328.7/	DATA1110
DATA TAISP8/						DATA1120
1	259.8,	271.8,	279.4,	285.2,	289.7,	DATA1130
2	293.4,	296.4,	299.1,	301.3,	306.0,	DATA1140
3	309.5,	312.3,	314.7,	316.8,	318.5,	DATA1150
4	321.5,	323.9,	325.9,	327.6,	329.1,	DATA1160
5	260.6,	272.5,	280.1,	285.8,	290.4,	DATA1170
6	294.0,	297.1,	299.7,	301.9,	306.5,	DATA1180
7	310.0,	312.9,	315.3,	317.3,	319.1,	DATA1190
8	322.0,	324.4,	326.3,	328.0,	329.5,	DATA1200
9	261.1,	273.0,	280.6,	286.3,	290.8,	DATA1210
A	294.5,	297.5,	300.1,	302.4,	306.9,	DATA1220
B	310.4,	313.3,	315.6,	317.6,	319.4,	DATA1230
C	322.3,	324.7,	326.6,	328.3,	329.8,	DATA1240
D	261.5,	273.4,	281.0,	286.5,	291.2,	DATA1250
F	294.8,	297.8,	300.4,	302.7,	307.2,	DATA1260
F	310.7,	313.5,	315.9,	317.9,	319.6,	DATA1270
G	322.5,	324.9,	326.8,	328.5,	330.0/	DATA1280
DATA TAISP9/						DATA1290
1	262.2,	274.0,	281.6,	287.2,	291.7,	DATA1300
2	295.3,	298.4,	300.9,	303.2,	307.7,	DATA1310
3	311.2,	314.0,	316.3,	318.3,	320.0,	DATA1320
4	322.9,	325.3,	327.2,	328.9,	330.3,	DATA1330
5	262.6,	274.4,	281.9,	287.5,	292.0,	DATA1340
6	295.7,	298.7,	301.3,	303.5,	308.0,	DATA1350
7	311.5,	314.3,	316.6,	318.6,	320.3,	DATA1360
8	323.2,	325.5,	327.4,	329.1,	330.5,	DATA1370
9	262.9,	274.7,	282.1,	287.8,	292.3,	DATA1380
A	295.9,	299.0,	301.5,	303.7,	308.2,	DATA1390
B	311.7,	314.5,	316.8,	318.8,	320.5,	DATA1400
C	323.4,	325.7,	327.6,	329.3,	330.7/	DATA1410
DATA TAISPA/						DATA1420
1	263.2,	275.0,	282.5,	288.0,	292.5,	DATA1430
2	296.1,	299.1,	301.7,	303.9,	308.4,	DATA1440
3	311.8,	314.6,	317.0,	318.9,	320.6,	DATA1450
4	323.5,	325.8,	327.7,	329.4,	330.8,	DATA1460
5	263.4,	275.2,	282.7,	288.2,	292.7,	DATA1470

6	296.3,	299.3,	301.9,	304.1,	308.5,	DATA1480
7	312.0,	314.8,	317.1,	319.1,	320.8,	DATA1490
8	323.6,	325.9,	327.9,	329.5,	330.9,	DATA1500
9	263.6,	275.3,	282.9,	288.4,	292.8,	DATA1510
A	296.4,	299.4,	302.0,	304.2,	308.7,	DATA1520
B	312.1,	314.9,	317.2,	319.2,	320.9,	DATA1530
C	323.7,	326.0,	327.0,	329.6,	331.0/	DATA1540
DATA ETSISP,CSTAR1,CSTAR2/.95,37.,4946./						DATA1550
END						DATA1560

BLOCK DATA						DATA0010
COMMON/PLKTX/ F2,X2,Y2,NX2,NY2						DATA0020
COMMON/PLKTJ/ F,X,Y,NX,NY						DATA0030
DIMENSION F(20,20),X(20,20),NX(20)						DATA0040
DIMENSION F2(15,15,5),X2(15,5),Y2(15,5),NX2(5),NY2(5)						DATA0050
DATA NX/11,0,9,2,18,12,15,14,16,9,0,8,17,14,17,5*0/						DATA0060
DATA X/0.,1.,2.,3.,4.,5.,6.,7.,8.,9.,10.,9*0., 20*0.,						DATA0070
A1940.,1952.,1956.,1960.,1964.,1968.,1975.,1980.,1982.,11*0.,						DATA0080
B-300.,300.,18*0.,						DATA0090
C22.,32.,40.,60.,70.,80.,90.,100.,120.,150.,160.,180.,200.,240.,						DATA0100
D320.,400.,480.,600.,2*0.,						DATA0110
E0.,.25.,.50,1.,1.5,2.,2.5,3.,3.5,5.,7.,10.,8*0.,						DATA0120
F1949.,1950.6,1952.4,1954.,1956.,1958.,1960.,1962.,1964.,1966.,						DATA0130
G1968.,1970.,1974.,1978.,1984.,5*0.,						DATA0140
H0.,2.0,2.1,2.2,2.3,2.35,2.4,2.45,2.5,2.6,2.7,2.8,2.9,3.0,6*0.,						DATA0150
I4.,5.,6.,7.,8.,9.,10.,11.,13.,15.,17.,20.,24.,28.,32.,35.,4*0.,						DATA0160
J.1.,.2.,.3.,.4.,.5.,.6.,.7.,.8,2.,11*0., 20*0.,						DATA0170
K0.,1.,2.,3.,4.,5.,6.,10.,12*0.,						DATA0180
L3.5,5.,6.,7.,8.,8.5,9.,9.5,10.,10.5,11.,12.,13.,14.,15.,16.,22.,						DATA0190
L3*0.,						DATA0200
M1945.,1949.,1953.,1955.,1957.,1959.,1961.,1963.,1965.,1967.,						DATA0210
N1969.,1973.,1977.,1981.,6*0.,						DATA0220
O1940.,1944.,1948.,1952.,1956.,1960.,1964.,1967.,1970.,1971.,						DATA0230
P1972.,1973.,1974.,1975.,1976.,1978.,1980.,3*0.,						DATA0240
Q100*0./						DATA0250
DATA F/1.,.82.,.67.,.56.,.48.,.41.,.36.,.32.,.29.,.26.,.24,9*0.,20*0.,						DATA0260
A1920.,2060.,2120.,2200.,2315.,2460.,2745.,2980.,3075.,11*0.,						DATA0270
P.91,1.09,18*0.,						DATA0280
C1.02,.965,.94,.91,.902,.9,.905,.914,.945,1.,1.02,1.045,1.07,						DATA0290
D1.105,1.165,1.218,1.264,1.320,2*0.,						DATA0300
F1.,.85.,.77.,.66.,.59.,.538,.498,.472,.456,.428,.4,.38,8*0.,						DATA0310
F3.,2.6,2.2,1.925,1.63,1.38,1.17,1.,.89,.8,.73,.67,.58,.52,.46,						DATA0320
F5*0.,						DATA0330
G1.,1.,1.001,1.003,1.0055,1.0075,1.01,1.013,1.0175,1.027,1.037,						DATA0340
H1.0485,1.0612,1.0745,6*C.,						DATA0350
I.79,.78,.772,.778,.787,.804,.827,.854,.922,.986,1.042,1.121,1.22,						DATA0360
J1.31,1.386,1.43,4*0.,						DATA0370
K.525,.6,.668,.728,.78,.828,.872,.912,1.412,11*0.,20*0.,						DATA0380
L2.44,2.56,2.71,2.87,3.04,3.22,3.41,4.21,12*0.,						DATA0390
M3.75,3.43,3.25,3.1,2.978,2.922,2.88,2.845,2.82,2.8,2.78,2.75,						DATA0400
N2.73,2.72,2.71,2.7,2.7,3*0.,						DATA0410
O1.2,1.15,1.1,1.078,1.058,1.042,1.03,1.02,1.010,1.004,.999,.99,						DATA0420
P.983,.98,6*C.,						DATA0430

C2.4, 2.25, 2.00, 1.85, 1.69, 1.49, 1.27, 1.11, .94, .89, .85, .82, .78, .76,
 R.72, .7, .67, 3*0., 100*0./
 DATA NX2/6, 6, 0, 0, 0/
 DATA NY2/6, 4, 0, 0, 0/
 DATA X2
 1 /5., 7., 9., 11., 14., 30., 9*0.,
 A0., 2., 4., 6., 8., 10., 9*0., 45*0./
 DATA Y2
 1 /25., 50., 125., 200., 400., 600., 9*0.,
 A1.3, 1.5, 1.65, 1.9, 11*0., 45*0./
 DATA F2
 1 / .71, .72, .75, .795, .89, .89, 9*0.,
 A.74, .77, .785, .83, .90, .90, 9*0.,
 B.78, .82, .84, .88, .92, .92, 9*0.,
 C.85, .88, .90, .92, .95, .95, 9*0.,
 C6*1., 9*0.,
 E2.065, 1.785, 1.64, 1.47, 1.4, 1.4, 9*0.,
 F135*0.,
 G4*1., 11*0.,
 H1.111, 1.128, 1.138, 1.154, 11*0.,
 I1.221, 1.255, 1.275, 1.302, 11*0.,
 J1.328, 1.378, 1.403, 1.438, 11*0.,
 K1.429, 1.500, 1.533, 1.561, 11*0.,
 L1.522, 1.614, 1.635, 1.677, 11*0.,
 M135*0.,
 N675*0./
 END

DATA0440
 DATA0450
 DATA0460
 DATA0470
 DATA0480
 DATA0490
 DATA0500
 DATA0510
 DATA0520
 DATA0530
 DATA0540
 DATA0550
 DATA0560
 DATA0570
 DATA0580
 DATA0590
 DATA0600
 DATA0610
 DATA0620
 DATA0630
 DATA0640
 DATA0650
 DATA0660
 DATA0670
 DATA0680
 DATA0690
 DATA0700

BLOCK DATA
 COMMON/AA/CP37AL(45), CP314A(45), CP27AL(45), CP214A(45), XCPBFN(36),
 6XCPBPP(36), XCPNC1(76), XCPNC2(57), XCP64(45), XCP65(45), XCP751(76),
 7XCP752(57), CNA211(45), CNA212(45), CNA22(78), CNA231(60), CNA232(45),
 8CNA24(77), VOLRA(78), EKFRB(34)
 A, CNA721(76), CNA722(76), CNA731(76), CNA732(76)
 DATA CP37AL/C.000,
 1 4.000, 2.860, 5.000, 3.380, 8.000, 2.530,
 2 10.000, 2.060,
 3 5.000,
 4 4.000, 3.550, 5.000, 4.100, 8.000, 3.650,
 5 10.000, 3.460,
 6 10.000,
 7 4.000, 4.360, 5.000, 4.500, 8.000, 4.270,
 8 10.000, 4.200,
 9 20.000,
 A 4.000, 4.980, 5.000, 4.950, 8.000, 4.900,
 B 10.000, 4.860,
 C 30.000,
 D 4.000, 5.180, 5.000, 5.160, 8.000, 5.100,
 E 10.000, 5.060/
 DATA CP314A/O.000,
 1 4.000, 3.270, 5.000, 3.800, 8.000, 2.800,
 2 10.000, 2.370,
 3 5.000,

DATA0010
 DATA0020
 DATA0030
 DATA0040
 DATA0050
 DATA0060
 DATA0070
 DATA0080
 DATA0090
 DATA0100
 DATA0110
 DATA0120
 DATA0130
 DATA0140
 DATA0150
 DATA0160
 DATA0170
 DATA0180
 DATA0190
 DATA0200
 DATA0210
 DATA0220
 DATA0230
 DATA0240
 DATA0250

4	4.000,	4.610,	5.000,	5.150,	8.000,	5.450,	DATA0260
5	10.000,	5.700,					DATA0270
6	10.000,						DATA0280
7	4.000,	6.950,	5.000,	6.950,	8.000,	6.980,	DATA0290
8	10.000,	7.000,					DATA0300
9	20.000,						DATA0310
A	4.000,	8.300,	5.000,	8.250,	8.000,	8.200,	DATA0320
B	10.000,	8.140,					DATA0330
C	30.000,						DATA0340
D	4.000,	8.530,	5.000,	8.520,	8.000,	8.460,	DATA0350
E	10.000,	8.430/					DATA0360
F	DATA CP27AL/C.000,						DATA0370
1	4.000,	2.650,	5.000,	3.200,	8.000,	2.400,	DATA0380
2	10.000,	1.900,					DATA0390
3	5.000,						DATA0400
4	4.000,	3.370,	5.000,	3.900,	8.000,	3.480,	DATA0410
5	10.000,	3.300,					DATA0420
6	10.000,						DATA0430
7	4.000,	4.100,	5.000,	4.230,	8.000,	4.100,	DATA0440
8	10.000,	4.000,					DATA0450
9	20.000,						DATA0460
A	4.000,	4.700,	5.000,	4.650,	8.000,	4.600,	DATA0470
B	10.000,	4.540,					DATA0480
C	30.000,						DATA0490
D	4.000,	4.900,	5.000,	4.850,	8.000,	4.800,	DATA0500
E	10.000,	4.750/					DATA0510
F	DATA CP214A/C.000,						DATA0520
1	4.000,	2.960,	5.000,	3.470,	8.000,	2.500,	DATA0530
2	10.000,	2.060,					DATA0540
3	5.000,						DATA0550
4	4.000,	4.300,	5.000,	4.830,	8.000,	5.170,	DATA0560
5	10.000,	5.400,					DATA0570
6	10.000,						DATA0580
7	4.000,	6.630,	5.000,	6.640,	8.000,	6.670,	DATA0590
8	10.000,	6.700,					DATA0600
9	20.000,						DATA0610
A	4.000,	8.000,	5.000,	7.970,	8.000,	7.880,	DATA0620
B	10.000,	7.840,					DATA0630
C	30.000,						DATA0640
D	4.000,	8.220,	5.000,	8.200,	8.000,	8.170,	DATA0650
E	10.000,	8.130/					DATA0660
F	DATA XCP8FN/1.000,						DATA0670
1	0.200,	0.397,	0.600,	0.454,	0.800,	0.467,	DATA0680
2	1.000,	0.472,					DATA0690
3	2.000,						DATA0700
4	0.200,	0.258,	0.600,	0.332,	0.800,	0.350,	DATA0710
5	1.000,	0.365,					DATA0720
6	3.000,						DATA0730
7	0.200,	0.195,	0.600,	0.265,	0.800,	0.285,	DATA0740
8	1.000,	0.297,					DATA0750
9	5.000,						DATA0760
A	0.200,	0.126,	0.600,	0.180,	0.800,	0.197,	DATA0770
B	1.000,	0.209/					DATA0780
C	DATA XCP8PP/1.000,						DATA0790
1	0.200,	0.453,	0.600,	0.478,	0.800,	0.480,	DATA0800

2		1.000,	0.475,					DATA0810
3		2.000,						DATA0820
4		0.200,	0.383,	0.600,	0.385,	0.800,	0.375,	DATA0830
5		1.000,	0.365,					DATA0840
6		3.000,						DATA0850
7		0.200,	0.330,	0.600,	0.315,	0.800,	0.308,	DATA0860
8		1.000,	0.297,					DATA0870
9		5.000,						DATA0880
A		0.200,	0.273,	0.600,	0.239,	0.800,	0.223,	DATA0890
B		1.000,	0.209/					DATA0900
	DATA XCPNC 1/	1.000,						DATA0910
1		0.000,	0.830,	0.100,	0.805,	0.200,	0.780,	DATA0920
2		0.300,	0.753,	0.400,	0.727,	0.500,	0.698,	DATA0930
3		0.600,	0.670,	0.700,	0.640,	0.800,	0.613,	DATA0940
4		2.000,						DATA0950
5		0.000,	0.668,	0.100,	0.642,	0.200,	0.615,	DATA0960
6		0.300,	0.589,	0.400,	0.560,	0.500,	0.525,	DATA0970
7		0.600,	0.485,	0.700,	0.435,	0.800,	0.365,	DATA0980
8		3.000,						DATA0990
9		0.000,	0.667,	0.100,	0.639,	0.200,	0.611,	DATA1000
A		0.300,	0.580,	0.400,	0.548,	0.500,	0.510,	DATA1010
B		0.600,	0.466,	0.700,	0.410,	0.800,	0.338,	DATA1020
C		4.000,						DATA1030
D		0.000,	0.666,	0.100,	0.637,	0.200,	0.610,	DATA1040
E		0.300,	0.576,	0.400,	0.543,	0.500,	0.503,	DATA1050
F		0.600,	0.456,	0.700,	0.398,	0.800,	0.321/	DATA1060
	DATA XCPNC 2/	5.000,						DATA1070
1		0.000,	0.666,	0.100,	0.636,	0.200,	0.607,	DATA1080
2		0.300,	0.573,	0.400,	0.539,	0.500,	0.498,	DATA1090
3		0.600,	0.448,	0.700,	0.390,	0.800,	0.311,	DATA1100
4		6.000,						DATA1110
5		0.000,	0.666,	0.100,	0.635,	0.200,	0.606,	DATA1120
6		0.300,	0.572,	0.400,	0.536,	0.500,	0.495,	DATA1130
7		0.600,	0.444,	0.700,	0.386,	0.800,	0.305,	DATA1140
8		7.000,						DATA1150
9		0.000,	0.666,	0.100,	0.635,	0.200,	0.605,	DATA1160
A		0.300,	0.570,	0.400,	0.535,	0.500,	0.493,	DATA1170
B		0.600,	0.443,	0.700,	0.385,	0.800,	0.300/	DATA1180
	DATA XCP64/	1.000,						DATA1190
1		0.200,	0.294,	0.400,	0.335,	0.700,	0.366,	DATA1200
2		1.000,	0.380,					DATA1210
3		2.000,						DATA1220
4		0.200,	0.178,	0.400,	0.232,	0.700,	0.270,	DATA1230
5		1.000,	0.288,					DATA1240
6		3.000,						DATA1250
7		0.200,	0.125,	0.400,	0.178,	0.700,	0.215,	DATA1260
8		1.000,	0.233,					DATA1270
9		4.000,						DATA1280
A		0.200,	0.095,	0.400,	0.144,	0.700,	0.179,	DATA1290
B		1.000,	0.197,					DATA1300
C		5.000,						DATA1310
D		0.200,	0.080,	0.400,	0.121,	0.700,	0.150,	DATA1320
E		1.000,	0.167/					DATA1330
	DATA XCP65/	1.000,						DATA1340
1		0.300,	0.333,	0.500,	0.373,	0.700,	0.381,	DATA1350

2	1.000,	0.380,					DATA1360
3	2.000,						DATA1370
4	0.300,	0.277,	0.500,	0.295,	0.700,	0.297,	DATA1380
5	1.000,	0.285,					DATA1390
6	3.000,						DATA1400
7	0.300,	0.235,	0.500,	0.246,	0.700,	0.243,	DATA1410
8	1.000,	0.232,					DATA1420
9	4.000,						DATA1430
A	0.300,	0.204,	0.500,	0.213,	0.700,	0.208,	DATA1440
B	1.000,	0.197,					DATA1450
C	5.000,						DATA1460
D	0.300,	0.177,	0.500,	0.186,	0.700,	0.181,	DATA1470
E	1.000,	0.167/					DATA1480
	DATA XCP751/1.000,						DATA1490
1	0.000,	0.496,	0.100,	0.487,	0.200,	0.475,	DATA1500
2	0.300,	0.463,	0.400,	0.451,	0.500,	0.438,	DATA1510
3	0.600,	0.422,	0.700,	0.405,	0.800,	0.381,	DATA1520
4	2.000,						DATA1530
5	0.000,	0.470,	0.100,	0.457,	0.200,	0.441,	DATA1540
6	0.300,	0.426,	0.400,	0.409,	0.500,	0.390,	DATA1550
7	0.600,	0.368,	0.700,	0.318,	0.800,	0.297,	DATA1560
8	3.000,						DATA1570
9	0.000,	0.469,	0.100,	0.453,	0.200,	0.436,	DATA1580
A	0.300,	0.419,	0.400,	0.400,	0.500,	0.379,	DATA1590
B	0.600,	0.353,	0.700,	0.317,	0.800,	0.273,	DATA1600
C	4.000,						DATA1610
D	0.000,	0.468,	0.100,	0.451,	0.200,	0.433,	DATA1620
E	0.300,	0.415,	0.400,	0.394,	0.500,	0.371,	DATA1630
F	0.600,	0.344,	0.700,	0.305,	0.800,	0.260/	DATA1640
	DATA XCP752/5.000,						DATA1650
1	0.000,	0.467,	0.100,	0.450,	0.200,	0.430,	DATA1660
2	0.300,	0.410,	0.400,	0.389,	0.500,	0.364,	DATA1670
3	0.600,	0.336,	0.700,	0.298,	0.800,	0.250,	DATA1680
4	6.000,						DATA1690
5	0.000,	0.467,	0.100,	0.449,	0.200,	0.428,	DATA1700
6	0.300,	0.408,	0.400,	0.385,	0.500,	0.360,	DATA1710
7	0.600,	0.330,	0.700,	0.291,	0.800,	0.243,	DATA1720
8	7.000,						DATA1730
9	0.000,	0.467,	0.100,	0.447,	0.200,	0.427,	DATA1740
A	0.300,	0.405,	0.400,	0.382,	0.500,	0.356,	DATA1750
B	0.600,	0.325,	0.700,	0.285,	0.800,	0.236/	DATA1760
	DATA CNA211/0.000,						DATA1770
1	0.200,	2.430,	0.300,	2.410,	0.400,	2.380,	DATA1780
2	0.500,	2.360,	0.600,	2.340,	0.800,	2.290,	DATA1790
3	1.000,	2.220,					DATA1800
4	0.500,						DATA1810
5	0.200,	2.780,	0.300,	2.810,	0.400,	2.820,	DATA1820
6	0.500,	2.825,	0.600,	2.830,	0.800,	2.800,	DATA1830
7	1.000,	2.760,					DATA1840
8	1.000,						DATA1850
9	0.200,	2.890,	0.300,	2.920,	0.400,	2.960,	DATA1860
A	0.500,	2.990,	0.600,	3.020,	0.800,	3.040,	DATA1870
B	1.000,	3.045/					DATA1880
	DATA CNA212/2.000,						DATA1890
1	0.200,	2.880,	0.300,	2.950,	0.400,	3.020,	DATA1900

2		0.500,	3.090,	0.600,	3.140,	0.800,	3.220,	DATA1910
3		1.000,	3.290,					DATA1920
4		3.000,						DATA1930
5		0.200,	2.860,	0.300,	2.950,	0.400,	3.030,	DATA1940
6		0.500,	3.120,	0.600,	3.190,	0.800,	3.320,	DATA1950
7		1.000,	3.390,					DATA1960
8		4.000,						DATA1970
9		0.200,	2.840,	0.300,	2.930,	0.400,	3.030,	DATA1980
A		0.500,	3.140,	0.600,	3.220,	0.800,	3.350,	DATA1990
B		1.000,	3.410/					DATA2000
	DATA CNA22/	0.000,						DATA2010
1		0.200,	1.250,	0.300,	1.530,	0.400,	1.730,	DATA2020
2		0.600,	1.960,	0.800,	2.110,	1.000,	2.220,	DATA2030
3		0.500,						DATA2040
4		0.200,	1.560,	0.300,	1.900,	0.400,	2.160,	DATA2050
5		0.600,	2.470,	0.800,	2.650,	1.000,	2.760,	DATA2060
6		1.000,						DATA2070
7		0.200,	1.630,	0.300,	2.040,	0.400,	2.380,	DATA2080
8		0.600,	2.820,	0.800,	3.020,	1.000,	3.060,	DATA2090
9		2.000,						DATA2100
A		0.200,	1.720,	0.300,	2.200,	0.400,	2.580,	DATA2110
B		0.600,	3.070,	0.800,	3.290,	1.000,	3.290,	DATA2120
C		3.000,						DATA2130
D		0.200,	1.790,	0.300,	2.280,	0.400,	2.670,	DATA2140
E		0.600,	3.180,	0.800,	3.390,	1.000,	3.390,	DATA2150
F		4.000,						DATA2160
G		0.200,	1.800,	0.300,	2.300,	0.400,	2.690,	DATA2170
H		0.600,	3.190,	0.800,	3.430,	1.000,	3.410/	DATA2180
	DATA CNA231/	0.000,						DATA2190
2		0.300,	1.930,	0.400,	1.900,	0.600,	1.880,	DATA2200
3		0.700,	1.870,	0.800,	1.860,	0.900,	1.860,	DATA2210
4		1.000,	1.860,					DATA2220
5		0.500,						DATA2230
6		0.300,	2.580,	0.400,	2.600,	0.600,	2.620,	DATA2240
7		0.700,	2.610,	0.800,	2.605,	0.900,	2.600,	DATA2250
8		1.000,	2.580,					DATA2260
9		1.000,						DATA2270
A		0.300,	2.690,	0.400,	2.790,	0.600,	2.910,	DATA2280
B		0.700,	2.940,	0.800,	2.980,	0.900,	2.990,	DATA2290
C		1.000,	3.000,					DATA2300
D		2.000,						DATA2310
E		0.300,	2.730,	0.400,	2.860,	0.600,	3.060,	DATA2320
F		0.700,	3.130,	0.800,	3.200,	0.900,	3.240,	DATA2330
G		1.000,	3.290/					DATA2340
	DATA CNA232/	3.000,						DATA2350
1		0.300,	2.760,	0.400,	2.910,	0.600,	3.140,	DATA2360
2		0.700,	3.220,	0.800,	3.290,	0.900,	3.360,	DATA2370
3		1.000,	3.430,					DATA2380
4		4.000,						DATA2390
5		0.300,	2.770,	0.400,	2.920,	0.600,	3.160,	DATA2400
6		0.700,	3.240,	0.800,	3.320,	0.900,	3.380,	DATA2410
7		1.000,	3.475,					DATA2420
8		5.000,						DATA2430
9		0.300,	2.790,	0.400,	2.940,	0.600,	3.165,	DATA2440
A		0.700,	3.245,	0.800,	3.325,	0.900,	3.408,	DATA2450

2	1.000,	0.380,					DATA1360
3	2.000,						DATA1370
4	0.300,	0.277,	0.500,	0.295,	0.700,	0.297,	DATA1380
5	1.000,	0.285,					DATA1390
6	3.000,						DATA1400
7	0.300,	0.235,	0.500,	0.246,	0.700,	0.243,	DATA1410
8	1.000,	0.232,					DATA1420
9	4.000,						DATA1430
A	0.300,	0.204,	0.500,	0.213,	0.700,	0.208,	DATA1440
B	1.000,	0.197,					DATA1450
C	5.000,						DATA1460
D	0.300,	0.177,	0.500,	0.186,	0.700,	0.181,	DATA1470
E	1.000,	0.167,					DATA1480
DATA XCP751/1.000,							
1	0.000,	0.496,	0.100,	0.487,	0.200,	0.475,	DATA1490
2	0.300,	0.463,	0.400,	0.451,	0.500,	0.438,	DATA1500
3	0.600,	0.422,	0.700,	0.405,	0.800,	0.381,	DATA1510
4	2.000,						DATA1520
5	0.000,	0.470,	0.100,	0.457,	0.200,	0.441,	DATA1530
6	0.300,	0.426,	0.400,	0.409,	0.500,	0.390,	DATA1540
7	0.600,	0.368,	0.700,	0.318,	0.800,	0.297,	DATA1550
8	3.000,						DATA1560
9	0.000,	0.469,	0.100,	0.453,	0.200,	0.436,	DATA1570
A	0.300,	0.419,	0.400,	0.400,	0.500,	0.379,	DATA1580
B	0.600,	0.353,	0.700,	0.317,	0.800,	0.273,	DATA1590
C	4.000,						DATA1600
D	0.000,	0.468,	0.100,	0.451,	0.200,	0.433,	DATA1610
E	0.300,	0.415,	0.400,	0.394,	0.500,	0.371,	DATA1620
F	0.600,	0.344,	0.700,	0.305,	0.800,	0.260,	DATA1630
DATA XCP752/5.000,							
1	0.000,	0.467,	0.100,	0.450,	0.200,	0.430,	DATA1640
2	0.300,	0.410,	0.400,	0.389,	0.500,	0.364,	DATA1650
3	0.600,	0.336,	0.700,	0.298,	0.800,	0.250,	DATA1660
4	6.000,						DATA1670
5	0.000,	0.467,	0.100,	0.449,	0.200,	0.428,	DATA1680
6	0.300,	0.408,	0.400,	0.385,	0.500,	0.360,	DATA1690
7	0.600,	0.330,	0.700,	0.291,	0.800,	0.243,	DATA1700
8	7.000,						DATA1710
9	0.000,	0.467,	0.100,	0.447,	0.200,	0.427,	DATA1720
A	0.300,	0.405,	0.400,	0.382,	0.500,	0.356,	DATA1730
B	0.600,	0.325,	0.700,	0.285,	0.800,	0.236,	DATA1740
DATA CNA211/0.000,							
1	0.200,	2.430,	0.300,	2.410,	0.400,	2.380,	DATA1750
2	0.500,	2.360,	0.600,	2.340,	0.800,	2.290,	DATA1760
3	1.000,	2.220,					DATA1770
4	0.500,						DATA1780
5	0.200,	2.780,	0.300,	2.810,	0.400,	2.820,	DATA1790
6	0.500,	2.825,	0.600,	2.830,	0.800,	2.800,	DATA1800
7	1.000,	2.760,					DATA1810
8	1.000,						DATA1820
9	0.200,	2.890,	0.300,	2.920,	0.400,	2.960,	DATA1830
A	0.500,	2.990,	0.600,	3.020,	0.800,	3.040,	DATA1840
B	1.000,	3.045,					DATA1850
DATA CNA212/2.000,							
1	0.200,	2.880,	0.300,	2.950,	0.400,	3.020,	DATA1860

2	0.500,	3.090,	0.600,	3.140,	0.800,	3.220,	DATA1910
3	1.000,	3.290,					DATA1920
4	3.000,						DATA1930
5	0.200,	2.860,	0.300,	2.950,	0.400,	3.030,	DATA1940
6	0.500,	3.120,	0.600,	3.190,	0.800,	3.320,	DATA1950
7	1.000,	3.390,					DATA1960
8	4.000,						DATA1970
9	0.200,	2.840,	0.300,	2.930,	0.400,	3.030,	DATA1980
A	0.500,	3.140,	0.600,	3.220,	0.800,	3.350,	DATA1990
B	1.000,	3.410/					DATA2000
DATA CNA22/		0.000,					DATA2010
1	0.200,	1.250,	0.300,	1.530,	0.400,	1.730,	DATA2020
2	0.600,	1.960,	0.800,	2.110,	1.000,	2.220,	DATA2030
3	0.500,						DATA2040
4	0.200,	1.560,	0.300,	1.900,	0.400,	2.160,	DATA2050
5	0.600,	2.470,	0.800,	2.650,	1.000,	2.760,	DATA2060
6	1.000,						DATA2070
7	0.200,	1.630,	0.300,	2.040,	0.400,	2.380,	DATA2080
8	0.600,	2.820,	0.800,	3.020,	1.000,	3.060,	DATA2090
9	2.000,						DATA2100
A	0.200,	1.720,	0.300,	2.200,	0.400,	2.580,	DATA2110
B	0.600,	3.070,	0.800,	3.290,	1.000,	3.290,	DATA2120
C	3.000,						DATA2130
D	0.200,	1.790,	0.300,	2.280,	0.400,	2.670,	DATA2140
E	0.600,	3.180,	0.800,	3.390,	1.000,	3.390,	DATA2150
F	4.000,						DATA2160
G	0.200,	1.800,	0.300,	2.300,	0.400,	2.690,	DATA2170
H	0.600,	3.190,	0.800,	3.430,	1.000,	3.410/	DATA2180
DATA CNA231/		0.000,					DATA2190
2	0.300,	1.930,	0.400,	1.900,	0.600,	1.880,	DATA2200
3	0.700,	1.870,	0.800,	1.860,	0.900,	1.860,	DATA2210
4	1.000,	1.860,					DATA2220
5	0.500,						DATA2230
6	0.300,	2.580,	0.400,	2.600,	0.600,	2.620,	DATA2240
7	0.700,	2.610,	0.800,	2.605,	0.900,	2.600,	DATA2250
8	1.000,	2.580,					DATA2260
9	1.000,						DATA2270
A	0.300,	2.690,	0.400,	2.790,	0.600,	2.910,	DATA2280
B	0.700,	2.940,	0.800,	2.980,	0.900,	2.990,	DATA2290
C	1.000,	3.000,					DATA2300
D	2.000,						DATA2310
E	0.300,	2.730,	0.400,	2.860,	0.600,	3.060,	DATA2320
F	0.700,	3.130,	0.800,	3.200,	0.900,	3.240,	DATA2330
G	1.000,	3.290/					DATA2340
DATA CNA232/		3.000,					DATA2350
1	0.300,	2.760,	0.400,	2.910,	0.600,	3.140,	DATA2360
2	0.700,	3.220,	0.800,	3.290,	0.900,	3.360,	DATA2370
3	1.000,	3.430,					DATA2380
4	4.000,						DATA2390
5	0.300,	2.770,	0.400,	2.920,	0.600,	3.160,	DATA2400
6	0.700,	3.240,	0.800,	3.320,	0.900,	3.380,	DATA2410
7	1.000,	3.475,					DATA2420
8	5.000,						DATA2430
9	0.300,	2.790,	0.400,	2.940,	0.600,	3.165,	DATA2440
A	0.700,	3.245,	0.800,	3.325,	0.900,	3.408,	DATA2450

2CDART4(86),CDART5(86),FLRM7(22),CDP701(102),CDP702(84),CDP703(42),PLK10040
 3CDP711(102),CDP712(84),CDP713(42),CDSPHR(30) PLK10050

DATA CDP51/ 0.000, 0.000, 10.000, 0.200, 20.000, 0.370, PLK10060
 1 30.000, 0.500, 40.000, 0.670, 50.000, 0.800, PLK10070
 2 60.000, 0.870, 70.000, 0.920, 80.000, 0.980, PLK10080
 3 90.000, 1.000/ PLK10090

DATA CDP50/ 0.000, 0.000, 10.000, 0.010, 20.000, 0.040, PLK10100
 1 30.000, 0.080, 40.000, 0.130, 50.000, 0.170, PLK10110
 2 60.000, 0.210, 70.000, 0.250, 80.000, 0.280, PLK10120
 3 90.000, 0.310/ PLK10130

DATA CDP53/ 0.000, 1.170, 0.100, 0.880, 0.150, 0.670, PLK10140
 1 0.200, 0.520, 0.250, 0.390, 0.300, 0.300, PLK10150
 2 0.350, 0.230, 0.400, 0.180, 0.450, 0.140, PLK10160
 3 0.500, 0.110, 0.550, 0.085, 0.600, 0.060, PLK10170
 4 0.800, 0.012, 1.000, 0.000/ PLK10180

DATA CDN0G/ 0.000, 0.000, 0.050, 0.008, 0.100, 0.017, PLK10190
 1 0.150, 0.033, 0.200, 0.053, 0.250, 0.078, PLK10200
 2 0.300, 0.107, 0.350, 0.134, 0.400, 0.166, PLK10210
 3 0.450, 0.201, 0.500, 0.241, 0.550, 0.281, PLK10220
 4 0.600, 0.326, 0.650, 0.375, 0.700, 0.430, PLK10230
 5 0.750, 0.484, 0.800, 0.542, 0.850, 0.640, PLK10240
 6 0.900, 0.665, 0.950, 0.731, 1.000, 0.797, PLK10250
 7 1.050, 0.867, 1.100, 0.940, 1.150, 1.016, PLK10260
 8 1.200, 1.104, 1.600, 1.850, 2.000, 2.700, PLK10270
 9 2.600, 4.450, 4.000, 9.800/ PLK10280

DATA CDN0C/ 0.000, 0.000, 0.050, 0.016, 0.100, 0.029, PLK10290
 1 0.150, 0.050, 0.200, 0.071, 0.250, 0.098, PLK10300
 2 0.300, 0.122, 0.350, 0.151, 0.400, 0.180, PLK10310
 3 0.450, 0.212, 0.500, 0.247, 0.550, 0.283, PLK10320
 4 0.600, 0.317, 0.650, 0.360, 0.700, 0.406, PLK10330
 5 0.750, 0.450, 0.800, 0.503, 0.850, 0.554, PLK10340
 6 0.900, 0.606, 0.950, 0.667, 1.000, 0.730, PLK10350
 7 1.050, 0.794, 1.100, 0.864, 1.150, 0.931, PLK10360
 8 1.200, 1.005, 1.600, 1.600, 2.000, 2.350, PLK10370
 9 2.600, 3.750, 4.000, 8.500/ PLK10380

DATA CDPN5/ 2.000, PLK10390
 1 4.000, 0.162, 5.000, 0.155, 6.500, 0.148, PLK10400
 2 8.000, 0.143, 10.000, 0.139, PLK10410
 3 2.500, PLK10420
 4 4.000, 0.113, 5.000, 0.107, 6.500, 0.104, PLK10430
 5 8.000, 0.101, 10.000, 0.100, PLK10440
 6 3.000, PLK10450
 7 4.000, 0.085, 5.000, 0.079, 6.500, 0.076, PLK10460
 8 8.000, 0.074, 10.000, 0.074, PLK10470
 9 3.500, PLK10480
 A 4.000, 0.066, 5.000, 0.062, 6.500, 0.058, PLK10490
 B 8.000, 0.056, 10.000, 0.056/ PLK10500

DATA CDPN1/ 0.000, 0.100, 0.200, 0.100, 0.400, 0.099, PLK10510
 1 0.700, 0.098, 0.900, 0.096, 1.200, 0.092, PLK10520
 2 1.300, 0.090, 1.500, 0.086, 1.800, 0.078, PLK10530
 3 2.000, 0.070, 2.300, 0.058, 2.600, 0.048, PLK10540
 4 2.900, 0.038, 3.200, 0.030, 3.400, 0.026, PLK10550
 5 3.500, 0.024, 3.700, 0.020, 3.900, 0.018, PLK10560
 6 4.000, 0.016, 4.200, 0.014, 4.400, 0.012, PLK10570
 7 4.600, 0.010, 5.000, 0.008, 5.300, 0.007, PLK10580

8		5.800,	0.006,	6.450,	0.006/			PLK10590
	DATA CONVK/	0.000,	0.000,	0.050,	0.007,	0.100,	0.016,	PLK10600
1		0.150,	0.029,	0.200,	0.042,	0.250,	0.060,	PLK10610
2		0.300,	0.083,	0.350,	0.106,	0.400,	0.132,	PLK10620
3		0.450,	0.160,	0.500,	0.190,	0.550,	0.223,	PLK10630
4		0.600,	0.260,	0.650,	0.297,	0.700,	0.341,	PLK10640
5		0.750,	0.384,	0.800,	0.433,	0.850,	0.480,	PLK10650
6		0.900,	0.531,	0.950,	0.581,	1.000,	0.637,	PLK10660
7		1.050,	0.701,	1.100,	0.769,	1.150,	0.834,	PLK10670
8		1.200,	0.901,	1.600,	1.450,	2.000,	2.050,	PLK10680
9		2.600,	3.300,	4.000,	7.500/			PLK10690
	DATA CDART1/	0.5,						PLK10700
X		0.000,	0.160,	0.050,	0.220,	0.100,	0.240,	PLK10710
1		0.150,	0.240,	0.200,	0.230,	0.250,	0.220,	PLK10720
2		0.300,	0.210,	0.350,	0.190,	0.400,	0.170,	PLK10730
3		0.450,	0.145,	0.500,	0.120,	0.550,	0.100,	PLK10740
4		0.600,	0.075,	0.650,	0.065,	0.700,	0.050,	PLK10750
5		0.750,	0.040,	0.800,	0.033,	0.850,	0.025,	PLK10760
6		0.900,	0.015,	0.950,	0.010,	1.000,	0.000,	PLK10770
X	1.0,							PLK10780
1		0.000,	0.480,	0.025,	0.570,	0.050,	0.600,	PLK10790
2		0.075,	0.620,	0.100,	0.600,	0.150,	0.580,	PLK10800
3		0.200,	0.510,	0.250,	0.480,	0.300,	0.440,	PLK10810
4		0.350,	0.380,	0.400,	0.320,	0.450,	0.250,	PLK10820
5		0.500,	0.210,	0.550,	0.160,	0.600,	0.130,	PLK10830
6	.65, .11, .7, .08, .8, .04,							PLK10840
7	.85, .02, .95, .003, 1., 0./							PLK10850
	DATA CDART2/	2.0,						PLK10860
9		0.000,	1.740,	0.025,	1.640,	0.050,	1.540,	PLK10870
A		0.075,	1.440,	0.100,	1.340,	0.150,	1.200,	PLK10880
B		0.200,	1.070,	0.250,	0.940,	0.300,	0.810,	PLK10890
C		0.350,	0.700,	0.400,	0.590,	0.450,	0.500,	PLK10900
D		0.500,	0.420,	0.550,	0.350,	0.600,	0.290,	PLK10910
E		0.650,	0.210,	0.700,	0.170,	0.800,	0.080,	PLK10920
F	.9, .013, .95, .004, 1.0, 0.0,							PLK10930
G	3.0,							PLK10940
1		0.000,	2.460,	0.025,	2.250,	0.050,	2.020,	PLK10950
2		0.075,	1.890,	0.100,	1.760,	0.150,	1.540,	PLK10960
3		0.200,	1.340,	0.250,	1.170,	0.300,	1.010,	PLK10970
4		0.350,	0.870,	0.400,	0.720,	0.450,	0.600,	PLK10980
5		0.500,	0.500,	0.550,	0.410,	0.600,	0.320,	PLK10990
6	.65, .25, .7, .2, .8, .08,							PLK11000
7	.9, .018, .95, .005, 1.0, 0.0/							PLK11010
	DATA CDART3/	5.000,						PLK11020
1		0.000,	3.320,	0.025,	3.010,	0.050,	2.650,	PLK11030
2		0.075,	2.460,	0.100,	2.270,	0.150,	1.970,	PLK11040
3		0.200,	1.710,	0.250,	1.480,	0.300,	1.260,	PLK11050
4		0.350,	1.080,	0.400,	0.910,	0.450,	0.770,	PLK11060
5		0.500,	0.620,	0.550,	0.510,	0.600,	0.410,	PLK11070
6		0.650,	0.310,	0.700,	0.240,	0.800,	0.110,	PLK11080
7	.9, .03, .95, .01, 1.0, 0.0,							PLK11090
8		6.000,						PLK11100
9		0.000,	3.720,	0.050,	2.960,	0.100,	2.470,	PLK11110
A		0.150,	2.110,	0.200,	1.840,	0.250,	1.600,	PLK11120
B		0.300,	1.390,	0.350,	1.170,	0.400,	0.990,	PLK11130

C		0.450,	0.840,	0.500,	0.700,	0.550,	0.540,	PLK11140
D	.6,	.45,	.65,	.34,	.7,	.25,		PLK11150
E	.75,	.185,	.8,	.12,	.85,	.075,		PLK11160
F	.9,	.035,	.95,	.012,	1.0,	0.0/		PLK11170
	DATA CDART4/	8.000,						PLK11180
1		0.000,	4.250,	0.025,	3.750,	0.050,	3.270,	PLK11190
2		0.075,	3.020,	0.100,	2.760,	0.150,	2.380,	PLK11200
3		0.200,	2.040,	0.250,	1.760,	0.300,	1.520,	PLK11210
4		0.350,	1.300,	0.400,	1.090,	0.450,	0.910,	PLK11220
5		0.500,	0.760,	0.550,	0.600,	0.600,	0.480,	PLK11230
6		0.650,	0.370,	0.700,	0.270,	0.800,	0.130,	PLK11240
7	.9,	.04,	.95,	.013,	1.0,	0.0,		PLK11250
8		10.000,						PLK11260
9		0.000,	5.000,	0.025,	4.270,	0.050,	3.560,	PLK11270
A		0.075,	3.280,	0.100,	2.990,	0.150,	2.560,	PLK11280
B		0.200,	2.210,	0.250,	1.910,	0.300,	1.630,	PLK11290
C		0.350,	1.390,	0.400,	1.160,	0.450,	0.970,	PLK11300
D		0.500,	0.820,	0.550,	0.660,	0.600,	0.520,	PLK11310
E		0.650,	0.410,	0.700,	0.270,	0.800,	0.140,	PLK11320
F	.9,	.042,	.95,	.014,	1.0,	0.0/		PLK11330
	DATA CDABT5/	16.000,						PLK11340
1		0.000,	5.600,	0.025,	5.000,	0.050,	4.100,	PLK11350
2		0.075,	3.700,	0.100,	3.340,	0.150,	2.910,	PLK11360
3		0.200,	2.500,	0.250,	2.160,	0.300,	1.860,	PLK11370
4		0.350,	1.630,	0.400,	1.360,	0.450,	1.140,	PLK11380
5		0.500,	0.920,	0.550,	0.750,	0.600,	0.580,	PLK11390
6		0.650,	0.440,	0.700,	0.320,	0.800,	0.140,	PLK11400
7	.9,	.043,	.95,	.015,	1.0,	0.0,		PLK11410
8		20.000,						PLK11420
9		0.025,	4.990,	0.050,	4.500,	0.100,	3.750,	PLK11430
A		0.150,	3.150,	0.200,	2.750,	0.250,	2.380,	PLK11440
B		0.300,	2.040,	0.350,	1.740,	0.400,	1.470,	PLK11450
C		0.450,	1.200,	0.500,	1.000,	0.550,	0.800,	PLK11460
D		0.600,	0.630,	0.650,	0.490,	0.700,	0.360,	PLK11470
E		0.750,	0.250,	0.800,	0.150,	0.850,	0.080,	PLK11480
F	.9,	.044,	.95,	.016,	1.0,	0.0/		PLK11490
	DATA FLRM7/	1.200,	18.200,	1.250,	18.400,	1.300,	18.400,	PLK11500
1		1.400,	18.100,	1.600,	16.900,	2.000,	14.900,	PLK11510
2		2.400,	13.200,	2.800,	11.600,	3.200,	10.300,	PLK11520
3		3.600,	9.100,	4.000,	8.100,			PLK11530
	DATA CDP701/	1.250,	1.500,	2.000,	3.000,	4.000,		PLK11540
1	2.000,	3.000,	4.000,	5.000,	6.000,	7.000,	8.000,	PLK11550
2		0.000,	0.200,	0.400,	0.600,	0.800,	1.000,	PLK11560
X		0.255,	0.210,	0.190,	0.213,	0.320,	0.520,	PLK11570
X		0.125,	0.110,	0.115,	0.170,	0.300,	0.520,	PLK11580
X		0.078,	0.070,	0.095,	0.160,	0.290,	0.520,	PLK11590
X		0.050,	0.050,	0.080,	0.155,	0.290,	0.520,	PLK11600
X		0.035,	0.040,	0.075,	0.152,	0.290,	0.520,	PLK11610
X		0.030,	0.035,	0.070,	0.151,	0.290,	0.520,	PLK11620
X		0.025,	0.030,	0.068,	0.150,	0.290,	0.520,	PLK11630
3		0.212,	0.202,	0.233,	0.311,	0.456,	0.668,	PLK11640
4		0.111,	0.117,	0.164,	0.263,	0.429,	0.669,	PLK11650
5		0.071,	0.082,	0.135,	0.245,	0.413,	0.669,	PLK11660
6		0.049,	0.060,	0.123,	0.232,	0.408,	0.668,	PLK11670
7		0.036,	0.050,	0.114,	0.230,	0.405,	0.668,	PLK11680

8	0.028,	0.045,	0.110,	0.227,	0.405,	0.668,	BLK11690
9	0.023,	0.042,	0.106,	0.227,	0.402,	0.669,	RLK11700
DATA CDP702/	0.180,	0.188,	0.236,	0.348,	0.518,	0.758,	RLK11710
B	0.055,	0.112,	0.181,	0.306,	0.493,	0.758,	RLK11720
C	0.055,	0.080,	0.156,	0.288,	0.800,	0.758,	PLK11730
D	0.041,	0.063,	0.140,	0.280,	0.479,	0.758,	PLK11740
E	0.027,	0.050,	0.133,	0.275,	0.477,	0.758,	PLK11750
F	0.022,	0.045,	0.132,	0.270,	0.476,	0.759,	PLK11760
G	0.016,	0.042,	0.130,	0.268,	0.475,	0.758,	PLK11770
X	0.154,	0.180,	0.258,	0.385,	0.582,	0.843,	RLK11780
1	0.079,	0.112,	0.200,	0.350,	0.568,	0.843,	RLK11790
2	0.049,	0.083,	0.175,	0.333,	0.558,	0.844,	RLK11800
3	0.034,	0.067,	0.163,	0.324,	0.550,	0.843,	RLK11810
4	0.025,	0.058,	0.156,	0.318,	0.549,	0.844,	RLK11820
5	0.019,	0.052,	0.150,	0.315,	0.545,	0.843,	RLK11830
6	0.017,	0.050,	0.150,	0.313,	0.545,	0.843,	RLK11840
DATA CDP703/	0.142,	0.171,	0.262,	0.408,	0.613,	0.868,	RLK11850
8	0.073,	0.112,	0.210,	0.369,	0.590,	0.868,	RLK11860
9	0.044,	0.083,	0.185,	0.350,	0.582,	0.869,	RLK11870
A	0.031,	0.068,	0.172,	0.340,	0.572,	0.869,	RLK11880
B	0.022,	0.063,	0.164,	0.340,	0.570,	0.869,	RLK11890
C	0.016,	0.055,	0.160,	0.333,	0.568,	0.869,	RLK11900
D	0.013,	0.054,	0.160,	0.332,	0.565,	0.869,	RLK11910
DATA CDP711/	1.250,	1.500,	2.000,	3.000,	4.000,		RLK11920
1	2.000,	3.000,	4.000,	5.000,	6.000,	7.000,	RLK11930
2	0.000,	0.200,	0.400,	0.600,	0.800,	1.000,	RLK11940
Z	0.220,	0.125,	0.090,	0.125,	0.270,	0.520,	RLK11950
7	0.110,	0.065,	0.070,	0.125,	0.270,	0.520,	RLK11960
Z	0.065,	0.040,	0.045,	0.125,	0.270,	0.520,	RLK11970
Z	0.045,	0.030,	0.045,	0.125,	0.275,	0.520,	RLK11980
Z	0.025,	0.025,	0.045,	0.130,	0.280,	0.520,	RLK11990
Z	0.025,	0.020,	0.045,	0.135,	0.285,	0.520,	RLK12000
Z	0.020,	0.015,	0.050,	0.140,	0.290,	0.520,	RLK12010
3	0.220,	0.140,	0.153,	0.235,	0.395,	0.670,	RLK12020
4	0.105,	0.093,	0.128,	0.220,	0.395,	0.670,	RLK12030
5	0.065,	0.060,	0.110,	0.215,	0.396,	0.670,	RLK12040
6	0.040,	0.048,	0.100,	0.212,	0.400,	0.670,	RLK12050
7	0.020,	0.038,	0.098,	0.210,	0.400,	0.670,	RLK12060
8	0.020,	0.033,	0.095,	0.210,	0.400,	0.670,	RLK12070
9	0.018,	0.030,	0.093,	0.210,	0.400,	0.670,	RLK12080
DATA CDP712/	0.157,	0.179,	0.205,	0.306,	0.478,	0.754,	RLK12090
B	0.095,	0.100,	0.153,	0.281,	0.473,	0.753,	RLK12100
C	0.055,	0.068,	0.134,	0.269,	0.465,	0.754,	RLK12110
D	0.035,	0.052,	0.125,	0.263,	0.469,	0.753,	RLK12120
E	0.025,	0.042,	0.124,	0.260,	0.479,	0.754,	RLK12130
F	0.018,	0.039,	0.115,	0.257,	0.468,	0.754,	RLK12140
G	0.015,	0.036,	0.115,	0.258,	0.469,	0.754,	RLK12150
X	0.173,	0.178,	0.235,	0.360,	0.564,	0.839,	RLK12160
1	0.088,	0.111,	0.185,	0.331,	0.549,	0.839,	RLK12170
2	0.053,	0.080,	0.169,	0.323,	0.541,	0.840,	RLK12180
3	0.036,	0.068,	0.156,	0.317,	0.538,	0.840,	RLK12190
4	0.026,	0.055,	0.150,	0.313,	0.539,	0.841,	RLK12200
5	0.019,	0.050,	0.145,	0.308,	0.538,	0.842,	RLK12210
6	0.014,	0.049,	0.142,	0.306,	0.537,	0.841,	RLK12220
DATA CDP713/	0.163,	0.173,	0.240,	0.380,	0.590,	0.868,	RLK12230

8	0.081,	0.111,	0.200,	0.355,	0.577,	0.867,	BLK12240
9	0.050,	0.082,	0.180,	0.340,	0.568,	0.868,	BLK12250
A	0.032,	0.070,	0.170,	0.335,	0.565,	0.869,	BLK12260
B	0.022,	0.063,	0.162,	0.333,	0.561,	0.869,	BLK12270
C	0.016,	0.058,	0.160,	0.330,	0.560,	0.869,	BLK12280
D	0.011,	0.055,	0.156,	0.325,	0.560,	0.870,	BLK12290
	DATA CDSPHR/0.000,	0.020,	0.250,	0.020,	0.500,	0.020,	BLK12300
1	0.750,	0.060,	1.000,	0.310,	1.250,	0.525,	BLK12310
2	1.500,	0.660,	1.750,	0.730,	2.000,	0.775,	BLK12320
3	2.500,	0.830,	3.000,	0.845,	4.000,	0.860,	BLK12330
4	5.000,	0.870,	6.000,	0.880,	10.000,	0.890,	BLK12340
END							BLK12350

ELOCK DATA

DATA FOR RCTM - COST PACKAGE

COMMON /CONLY/ KINDPS, DIAERT, SOMMOR(8)

COMMON /GUIDCO/ COSN, NSCRC, WTGUID, SAWTI(3), SAWTJ(3), SAFCI(3),

1 SAFCJ(3), KSASTB, KSAAGT, NSACHN, KSASGT, AWTI(3), AWTJ(3),

2 APPEKJ(3), APPEKJ(3), AFCI, AFCJ, KASTB, KAAGT, NACHN, KASGT,

3 GIRWT(3), GIRBSP(3), GIRNDT(3), GIRFC(3), KGTabL, KGTYPE,

4 DUMGX(9)

COMMON /QACOST/ QMAXQ, VMAXQ, DUMQA(8)

REAL NOZWT, MP

COMMON /COMVLS/ WTANK, VEXIN, VREQ, GGW, HPPUMP, WTFUEL, WCOMM, VCOMI,

1 P5, Y1, WNDZ, KEM, MATTK, A, DCOM, WMC, VBI, DTHRT, RNOZI, NCZWT, MP, CASEM,

2 FNET, WT, WF, FMAX, S, T4, METTJ, ZXNB, D, WM, FC, PPEAK, RSP, NDET, CA, WCS,

3 WWH, WTC, WTP, WGG, WSC, WLV, VGT, WC, WP, DP, WN, METAL, NCONF

COMMON /COSTIN/ PRIA1, PRIA2, PRJC, PRIA3, PRIB3, PRIA4, PRIE4, PRIA5,

1PRIA6, PRIA7, PRIA8, PRIB8, PRIA9, PRIG9, PRIA10, PRIA11, PRIG11, PRIA12,

2PRIB12, PRIE12, PRIA13, PRIE13, PRIA14, PRIE14, PRIA15, PRIE15, PRIA16,

3PRIE16, PRIA17, PRIE17, PRIA18, PRIB18, PRIE18, PRIA19, PRIE19, PRIA20,

4PRIA21, PRIA22, PRIE22, PRIA23, PRIB23, PRIC23, PRIA24, PRIC24, PRIA25,

5PRIE25, PRIA26, PRIE26, PRIC26, PRNA1, PRNA2, PRNA3, PRNB3, PRNA4, PRNE4,

6PRNA5, PRNA6, PRNA7, PRNA8, PRNB8, PRNA9, PRNG9, PRNA10, PRNA11, PRNG11,

7PRNA12, PRNB12, PRNE12, PRNA13, PRNE13, PRNA14, PRNE14, PRNA15, PRNA16,

8PRNA17, PRNA18, PRNB18, PRNA19, PRNB19, PRNC19, PRNA20, PRNC20, PRNA21,

9PRNB21, PRNA22, PRNB22, PRNC22, PLPC, PLA1, PLA3, PLB3, PLA4, PLA6, PLAR,

APLB8, PLA9, PLA11, PLB11, PLA13, PLB13, PLC13, PLD13, PLA14, PLD14, PLA15,

PLR15, PLF15, PLF15, PLA16, PLE16, PLA17, PLA18, PLB18, PLC18, PLA19, PLA20,

CLP20, PLA21, PLR21, PLC21, PTA1, PTD1, PTA4, PTB4, PTA5, PTB5, PTF5, PTA6,

PTF6, PTA7, PTB7, PTC7, PTJC, PTA8, PTD8, PTA9, PTB9, PTA10, PTB10, PTC10,

FPEA3, PER3, PEA4, PEE4, PEA5, PEF5, PEA6, PEB6, PEE6, PEA7, PEE7, PEA8, PEA9,

FPEA10, PEB10, PFC10, PEA11, PEB11, PEE11, PEB12, PFC12, PEA13, PEB13,

GPSA5, PSF5, PSA6, PSF6, PSG6, PSA7, PSF7, PSA8, PSA9, PSA10, PSB10, PSC10,

HPSA11, PSB11, PSE11, CFT, PFT, CFCASE, PFCASE, CFC, PFC, CFM, PFM, IYEAR

COMMON /COSTIN/ PRIE1, PRIC1, PRIE2, PRIC2, PRIE4, PRIC4, PRID4, PRIE5,

1PRIC5, PRIE9, PRIC9, PRID9, PRIE11, PRIC11, PRID11, PRIE11,

2PRIE11, PRIC12, PRID12, PRIE13, PRIC13, PRID13, PRIE14, PRIC14, PRID14,

3PRIE15, PRIC15, PRID15, PRIE16, PRIC16, PRID16, PRIE17, PRIC17, PRID17,

4PRIE17, PRIC18, PRID18, PRIE19, PRIC19, PRID19, PRIE24, PRIC24, PRID24,

5, PRNC2, PRNB4, PRNC4, PRND4, PRNB5, PRNC5, PRNB9, PRNC9, PRND9, PRNE9,

6, PRNB11, PRNC11, PRND11, PRNE11, PRNF11, PRNC12, PRND12, PRNB13, PRNC13,

7PRND13, PRNB14, PRNC14, PRND14, PRNB15, PRNC15, PRND15, PRNB16, PRNC16,

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8PRND16,PRNB17,PRNC17,PRND17,PRNE17,PRNB20,PLB1,PLC1,PLA2,PLB2,PLB4DATA0410
9,PLC4,PLA5,PLB5,PLB6,PLC6,PLA7,PLB7,PLB9,PLC9,PLA10,PLB10,PLA12, DATA0420
APLB12,PLB14,PLC14,PLC15,PLD15,PLB16,PLC16,PLD16,PLB19,PLC19,PTP1, DATA0430
BPTC1,PTA2,PTB2,PTA3,PTB3,PTC5,PTD5,PTB6,PTC6,PTD6,PTB8,PTC8,PEA1, DATA0440
CPFB1,PEC1,PEA2,PER2,PEC2,PER4,PEC4,PED4,PER5,PEC5,PED5,PEF5,PEC6, DATA0450
CPED6,PER7,PEC7,PED7,PEC11,PED11,PSA1,PSB1,PSC1,PSA2,PSB2,PSC2,PSR4DATA0460
E,PSC4,PSD4,PSB5,PSC5,PSD5,PSE5,PSB6,PSC6,PSD6,PSE6,PSB7,PSC7,PSD7, DATA0470
FPSE7,PSC11,PSD11,PRND22,PLD21,PLE21,PTD10,PTE10,PRID26 DATA0480
COMMON /CONSTIN/ PROFIT,QD,R,AF1,AFB1,AFC1,AFD1,AFF1,AFB2,AFB3, DATA0490
1AFG2,AFB3,AFB3,AFG3,AFB4,AFB4,AFC4,AFD4,AFJ4,AFB5,AFB5,AFC5,AFH5, DATA0500
2AFB6,AFB6,AFG6,AFB7,AFC7,AFD7,AFB8,AFB8,AFC8,AFD8,AFI8,AFB9,AFB9, DATA0510
3AFC9,AFC9,AFJ9,AFB10,AFC10,AFH10,AFB11,AFB11,AFG11,AFB12, DATA0520
4AFC12,AFD12,AFB13,AFB13,AFC13,AFB14,AFB14,AFC14,KFUZE,WA1,WF1,WF1, DATA0530
5WA2,WC2,WF2,KGA1N,CA1,CE1,CF1,CA2,CE2,CF2,CA3,CE3,CF3,GA1,GB1,GF1, DATA0540
6KLE6,KGT6,KSTAR,KAGATE,NCHAN,KSGATE,GA2,GB2,GK2,GA3,GB3,GQ3,GA4, DATA0550
7GR4,GM4,GA5,GB5,GH5,KG,KC,KW,KA,KP,IGTYPE,ICTYPE,I PRCS DATA0560
COMMON /CONSTIN/ AFE1,AFF1,AFG1,AFH1,AFC2,AFD2,AFF2,AFF2,AFC3, DATA0570
1AFD3,AFF3,AFF3,AFF4,AFF4,AFG4,AFH4,AFI4,AFD5,AFF5,AFF5,AFG5,AFC6, DATA0580
2AFD6,AFF6,AFF6,AFB7,AFF8,AFF8,AFG8,AFH8,AFF9,AFF9,AFG9,AFH9,AFI9, DATA0590
3AFD10,AFF10,AFF10,AFG10,AFC11,AFD11,AFF11,AFF11,AFB12,WB1,WC1,WD1, DATA0600
4WB2,WC2,CB1,CC1,CD1,CB2,CC2,CD2,CB3,CC3,CD3,GC1,GD1,GE1,GC2,GD2, DATA0610
5CF2,CF2,GG2,GH2,G12,GJ2,GC3,GD3,GE3,GF3,GG3,GH3,G13,GJ3,GK3,GL3, DATA0620
6CM3,GN3,GP3,GC4,GD4,GE4,GF4,GG4,GH4,G14,GJ4,GK4,GL4,GC5,GD5,GE5, DATA0630
7CF5,GG5,CFTTAB(11),PFTTAB(11) DATA0640
COMMON /CSTPRV/ CBLC,CBMC,CCASE,CCFU,CCL,CCM,CCOMI,CCOML,CCOMM, DATA0650
1 CCONT,CCPD,CBFRU,CBRD,CETJ,CEXIN,CGFU,CGRD, DATA0660
2 CGT,CGTOT,CIGN,CIRJFU, CIRJRD, CLF,CLFL,CLGG,CLI,CLM, DATA0670
3 CLR FU,CLRRD,CLRT,CLTC,CLTP,CM,CMGG,CMM,CMT,CMTP, DATA0680
4 CMV,CNOZ,CNRJFU, CNRJR, CP,CPAFI,CPENG,CPL,CPLC, DATA0690
5 CPMFGL,CPMFGM,CPOA,CPR,CPRC,CPS,CPSMG,CPN2,CPSRAM,CPSSGG, DATA0700
6 CPTOOL,CRAFI,CRDEV,CREG,CRENG,CRTD,CRJC,CRMFG,CRMFGM,CRA, DATA0710
7 CRTOOL,CSA,CSR FU,CSR RD,CSRT,CT,CTAFI,CTC,CTEB,CTIRJ,CTJFU, DATA0720
8 CTJLF,CTJLFL,CTJRD,CTJT, CTL,CTM,CTNRJ,CTP,CWH,CWHFU,CWHR, DATA0730
9 CPDCC,CRPS,CPFU,PROFPR,PRFUAF,PRRAF,CCLB,CCMB,CTCB,CLIB,CNCZB, DATA0740
A CPRR,CPLB,CIGNB,CSAB,PROFEX DATA0750
DATA KINDPS,DIAERT,SOMMOR/41,1.,8*0./ DATA0760
DATA CFT,PFT,CFCASE,PF CASE,CFC,PFC,CFM,PFM/8*0.0/ DATA0770
DATA CFTTAB/.6,1.,1.,.6,.2,2.5,1.,1.,.6,3.241,1./ DATA0780
DATA PFTTAB/.229,.274,1.,.929,.257,.723,2.571,1.386,22.857,1.281, DATA0790
1 1./ DATA0800
DATA KG,KC,KW,KA,KP,IGTYPE,ICTYPE, IPRCS/8*0/ DATA0810
DATA WWH/0./,QA/0./,WCS/0./,FC/0./,BSP/0./,NDET/0./,PPEAK/0./ DATA0820
DATA FNET/0./,T4/0./,METTJ/0./,WTC/0./,WTP/0./,WGG/0./,WSC/0./ DATA0830
DATA WL V/0./,VGT/0./,WT/0./,WC/0./,WF/0./,WP/0./,A/0./,S/0./ DATA0840
DATA FMAX/0./,METAL/0./,D/0./,WM/0./,WMC/0./,DP/0./ DATA0850
DATA DTHRT/0./,RNOZ/0./,WN/0./ DATA0860
DATA NCONFG/0./,ZXNB/0./,R5/0./,Y1/0./,WNOZ/0./,KFM/0./,MATTK/0/ DATA0870
DATA CCOM/0./,VBI/0./,NOZWT/0./,MP/0./,CASEM/0./,WTANK/0./ DATA0880
DATA VEXIN/0./,VREQ/0./,GGW/0./,HPPUMP/0./,WTFUEL/0./,WCOMM/0./ DATA0890
DATA VCCMI/0./ DATA0900
C WARHEAD COST PRE-STORED VALUES DATA0910
DATA WA1/1.0/,WB1/103.43/,WC1/23.096/,WD1/1352.0/,WE1/1.0/ DATA0920
DATA WF1/0.0/,WA2/1.0/,WB2/64.911/,WC2/43.295/,WD2/1.0/ DATA0930
DATA WE2/0.0/,KFUZE/0/ DATA0940
C CONTROLS COST PRE-STORED VALUES DATA0950

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	DATA KGAIN/0./,CA1/1.0./,CR1/4798./,CC1/222.7/,CD1/5796.3/,CE1/1.0/	DATA0960
	DATA CF1/0./,CA2/1.0./,CR2/48./,CC2/881./,CD2/5116./,CE2/1.0/	DATA0970
	DATA CF2/0./,CA3/1./,CR3/62./,CC3/213./,CD3/1880./,CE3/1./,CF3/0./	DATA0980
C	PROPULSION (SOLID SUSTAINER) COST PRE-STORED VALUES	DATA0990
	DATA PSA1/.008166/,PSB1/140./,PSC1/.333/,PSA2/.02022/	DATA1000
	DATA PSB2/140./,PSC2/.333/,PSA3/1./,PSB3/0./,PSA4/1./	DATA1010
	DATA PSB4/.001035/,PSC4/198./,PSD4/.333/,PSE4/0./,PSA5/1./	DATA1020
	DATA PSB5/.001755/,PSC5/4.6788/,PSD5/1.4045/,PSE5/1.5487/	DATA1030
	DATA PSF5/0./,PSA6/1./,PSB6/100000./,PSC6/32.006/,PSD6/.069/	DATA1040
	DATA PSE6/1000./,PSF6/1./,PSG6/0./,PSA7/1./,PSB7/.00343/	DATA1050
	DATA PSC7/100000./,PSD7/32.006/,PSE7/.387/,PSF7/0./	DATA1060
	DATA PSA8/.19305/,PSA9/.3861/	DATA1070
	DATA PSA10/1./,PSP10/1./,PSC10/0./,PSA11/1./,PSB11/1./	DATA1080
	DATA PSC11/16.551/,PSD11/.4263/,PSE11/0./	DATA1090
	DATA PSPC/.1/	DATA1100
C	AIRFRAME AND INTEGRATION COST PRE-STORED VALUES	DATA1110
	DATA PROFIT/.1/,QD/20./,R/1./	DATA1120
	DATA AFA1/26./,AFB1/1./,AFC1/1./,AFD1/1./	DATA1130
	DATA AFE1/.0396/,AFF1/.791/,AFG1/1.526/,AFH1/.183/,AFI1/0./	DATA1140
	DATA AFA2/1./,AFB2/1./,AFC2/.008325/,AFD2/.873/,AFF2/1.89/	DATA1150
	DATA AFF2/.346/,AFG2/C./,AFA3/1./,AFB3/1./,AFC3/.001244/	DATA1160
	DATA AFC3/1.16/,AFE3/1.371/,AFF3/1.281/,AFG3/0./,AFA4/19./	DATA1170
	DATA AFB4/1./,AFC4/1./,AFD4/1./,AFE4/4.0127/,AFF4/.764/,AFG4/.899/	DATA1180
	DATA AFA4/.178/,AFI4/.066/,AFJ4/0./,AFA5/12./,AFB5/1./,AFC5/1./	DATA1190
	DATA AFC5/28.984/,AFE5/.74/,AFF5/.543/,AFG5/.524/,AFH5/0./	DATA1200
	DATA AFA6/1./,AFB6/1./,AFC6/37.632/,AFD6/.689/,AFF6/.624/	DATA1210
	DATA AFF6/.792/,AFG6/C./,AFA7/1./,AFB7/.13/,AFC7/1./,AFD7/0./	DATA1220
	DATA AFA8/26./,AFB8/1./,AFC8/1./,AFD8/1./,AFE8/.0396/,AFF8/.791/	DATA1230
	DATA AFC8/1.526/,AFH8/.183/,AFI8/0./	DATA1240
	DATA AFA9/19./,AFB9/1./,AFC9/1./,AFD9/1./	DATA1250
	DATA AFF9/4.0127/,AFF9/.764/,AFG9/.899/,AFH9/.178/,AFI9/.066/	DATA1260
	DATA AFJ9/0./	DATA1270
	DATA AFA10/12./,AFB10/1./,AFC10/1./,AFD10/28.984/,AFE10/.74/	DATA1280
	DATA AFF10/.543/,AFG10/.524/,AFH10/0./	DATA1290
	DATA AFA11/1./,AFB11/1./,AFC11/37.632/,AFD11/.689/,AFE11/.624/	DATA1300
	DATA AFF11/.792/,AFG11/0./	DATA1310
	DATA AFA12/1./,AFB12/.13/,AFC12/1./,AFD12/0./	DATA1320
	DATA AFA13/1./,AFB13/1./,AFC13/0./	DATA1330
	DATA AFA14/1./,AFB14/1./,AFC14/0./	DATA1340
C	GUIDANCE SYSTEM COST PRE-STORED VALUES	DATA1350
	DATA GA1/1./,GB1/1./,GC1/8.37/,GD1/.0157/,GE1/.35/,GF1/0./	DATA1360
	DATA GA2/1./,GB2/1./,GC2/7129./,GD2/-.056/,GE2/62./,GF2/2.35/	DATA1370
	DATA GC2/10500./,GH2/2400./,GI2/143./,GJ2/2885./,GK2/0./	DATA1380
	DATA GA3/1./,GB3/1./,GC3/7129./,GD3/-.056/,GE3/62./,GF3/2.35/	DATA1390
	DATA GK3/1500./,GL3/1620./,GM3/.33/,GN3/.041/,GP3/2.5/	DATA1400
	DATA GO3/0./	DATA1410
	DATA GG3/10500./,GH3/2400./,GI3/143./,GJ3/2885./	DATA1420
	DATA GA4/1./,GB4/1./,GC4/7129./,GD4/-.056/,GE4/62./,GF4/2.35/	DATA1430
	DATA GC4/10500./,GH4/2400./,GI4/143./,GJ4/2885./	DATA1440
	DATA GK4/1520./,GL4/7100./,GM4/0./,GA5/1./,GB5/1./,GC5/9018./	DATA1450
	DATA GD5/.177/,GE5/.147/,GF5/175./,GG5/3700./,GH5/0./	DATA1460
	DATA KSTAR/0/,KAGATE/0/,NCHAN/0/,KSGATE/0/	DATA1470
C	PROPULSION (TURBOJET) COST PRE-STORED VALUES	DATA1480
C	PTB1 AND PTC1 ARE SET BY TURBOJET RTNE. IF NOT SUPPLIED	DATA1490
	DATA PTA1/1./,PTB1/0./,PTC1/C./,PTD1/0./,PTA2/5.148/,PTB2/.2608/	DATA1500

	DATA PTA3/4.415/,PTR3/.2608/,PTA4/1./,PTB4/0./	DATA1510
	DATA PTA5/1./,PTR5/0.1/,PTC5/3125./,PTD5/.069/	DATA1520
	DATA PTE5/0./,PTA6/1./,PTB6/.0001/,PTC6/3125./,PTD6/.029/,PTE6/0./	DATA1530
	DATA PTA7/1./,PTB7/1./,PTC7/0./,PTJC/.1/,PTA8/1./,PTB8/16.22/	DATA1540
	DATA PTC8/.7436/,PTD8/0./,PTA9/1./,PTB9/0./,PTA10/1./	DATA1550
	DATA PTR10/1./,PTC10/0./,PTD10/16.22/,PTE10/.7436/	DATA1560
C	PROPULSION (LIQUID ROCKET) COST PRE-STORED VALUES	DATA1570
	DATA PLA1/10./,PLB1/639.1/,PLC1/.5/,PLA2/201./,PLB2/.75/,PLA3/1./	DATA1580
	DATA PLB3/0./,PLA4/10./,PLB4/234.9/,PLC4/.63/,PLA5/340.7/	DATA1590
	DATA PLB5/.81/,PLA6/10./,PLB6/361.9/,PLC6/.5/,PLA7/174.8/	DATA1600
	DATA PLB7/.86/,PLA8/1./,PLB8/0./,PLA9/10./,PLB9/125.9/,PLC9/.7/	DATA1610
	DATA PLA10/1355./,PLB10/.63/,PLA11/1./,PLB11/0./,PLA12/122.83/	DATA1620
	DATA PLB12/.4949/,PLA13/1./,PLB13/.275/,PLC13/.275/,PLD13/0./	DATA1630
C	PLB14 AND PLC14 ARE SET BY LIQUID ROCKET RTNE. IF NOT SUPPLIED	DATA1640
	DATA PLA14/1./,PLB14/0./,PLC14/0./,PLD14/0./,PLA15/1./	DATA1650
	DATA PLB15/.11/,PLC15/3125./,PLD15/.069/,PLE15/1.18/,PLE15/0./	DATA1660
	DATA PLA16/1./,PLB16/.0001/,PLC16/3125./,PLD16/.029/,PLE16/0./	DATA1670
	DATA PLA17/.1925/,PLA18/1./,PLB18/1./,PLC18/0./,PLA19/1./	DATA1680
	DATA PLB19/.231/,PLC19/3000./,PLA20/1./,PLB20/0./	DATA1690
	DATA PLA21/1./,PLB21/1./,PLC21/0./,PLD21/.231/,PLE21/3000./	DATA1700
	DATA PLPC/.1/	DATA1710
C	PROPULSION (EXTERNAL BOOSTER) COST PRE-STORED VALUES	DATA1720
	DATA PFA1/.008166/,PEB1/140./,PEC1/.333/	DATA1730
	DATA PFA2/.02022/,PEB2/140./,PEC2/.333/	DATA1740
	DATA PFA3/1./,PEB3/0./,PEA4/1./,PEB4/.001039/,PEC4/198./	DATA1750
	DATA PED4/.323/,PEE4/0./	DATA1760
	DATA PFA5/1./,PEB5/.001755/,PEC5/4.6788/,PED5/1.4045/,PEE5/1.5487/	DATA1770
	DATA PEF5/0./	DATA1780
	DATA PFA6/1./,PEB6/1./,PEC6/3125./,PED6/.069/,PEE6/0./	DATA1790
	DATA PFA7/1./,PEB7/.00343/,PEC7/3125./,PED7/.387/,PEE7/0./	DATA1800
	DATA PFA8/.2861/,PEA9/.19305/	DATA1810
	DATA PFA10/1./,PEB10/1./,PEC10/0./	DATA1820
	DATA PFA11/1./,PEB11/1./,PEC11/14.392/,PED11/.4263/	DATA1830
	DATA PFE11/0./,PEB11/1/	DATA1840
C	PROPULSION (INTEGRAL RAMJET) COST PRE-STORED VALUES	DATA1850
	DATA PRIA1/1./,PRIB1/5.148/,PRIC1/.2608/	DATA1860
	DATA PRIA2/1./,PRIB2/4.415/,PRIC2/.2608/	DATA1870
	DATA PRIA3/1./,PRIB3/0./	DATA1880
	DATA PRIA4/1./,PRIB4/.001039/,PRIC4/198./,PRID4/.333/,PRIF4/0./	DATA1890
	DATA PRIA5/1./,PRIB5/122.83/,PRIC5/.4949/	DATA1900
	DATA PRIA6/.275/,PRIA7/.275/,PRIA8/1./,PRIB8/0./	DATA1910
	DATA PRIA9/1./,PRIB9/3.086/,PRIC9/.0577/,PRID9/4./,PRIF9/.36/	DATA1920
	DATA PRIF9/.075/,PRIG9/0./	DATA1930
	DATA PRIA10/5.1575/,PRIA11/1./,PRIB11/1.08/,PRIC11/2.543/	DATA1940
	DATA PRID11/.014/,PRIF11/.00002/,PRIF11/2./,PRIG11/0./	DATA1950
	DATA PRIA12/1./,PRIB12/1./,PRIC12/3125./,PRID12/.069/,PRIF12/0./	DATA1960
	DATA PRIA13/1./,PRIB13/.0001/,PRIC13/3125./,PRID13/.029/	DATA1970
	DATA PRIF13/0./	DATA1980
	DATA PRIA14/1./,PRIB14/.0096/,PRIC14/140./,PRID14/.333/	DATA1990
	DATA PRIF14/0./	DATA2000
	DATA PRIA15/1./,PRIB15/.02378/,PRIC15/140./,PRID15/.333/	DATA2010
	DATA PRIF15/0./	DATA2020
	DATA PRIA16/1./,PRIB16/.001155/,PRIC16/198./,PRID16/.333/	DATA2030
	DATA PRIF16/0./	DATA2040
	DATA PRIA17/1./,PRIB17/.0026234/,PRIC17/4.6788/,PRID17/1.4045/	DATA2050

	DATA PR IE17/1.5487/,PR IF17/0./	DATA2060
	DATA PP IA18/1./,PR IB18/1./,PR IC18/3125./,PR ID18/.069/,PR IE18/0./	DATA2070
	DATA PR IA19/1./,PP IB19/.00343/,PR IC19/3125./,PR ID19/.387/,	DATA2080
	1 PR IE19/0./	DATA2090
	DATA PR IA20/.3861/,PR IA21/.19305/	DATA2100
	DATA PR IA22/1./,PR IB22/0./,PR IA23/1./,PR IB23/1./,PR IC23/0./	DATA2110
	DATA PR IA24/1./,PR IB24/2422./,PR IC24/0./,PR IA25/1./,PR IB25/0./	DATA2120
	DATA PR IA26/1./,PR IB26/1./,PR IC26/0./,PR ID26/2422./,PR JC/.1/	DATA2130
C	PROPULSION (NON-INTEGRAL RAMJET) COST PRE-STORED VALUES	DATA2140
C	PRJC IS INITIALIZED IN INTEGRAL RAMJET DATA	DATA2150
	DATA PRNA1/1./,PRNB1/5.148/,PRNC1/.2608/	DATA2160
	DATA PRNA2/1./,PRNB2/4.415/,PRNC2/.2608/	DATA2170
	DATA PRNA3/1./,PRNB3/0./	DATA2180
	DATA PRNA4/1./,PRNB4/.001039/,PRNC4/198./,PRND4/.333/,PRNE4/0./	DATA2190
	DATA PRNA5/1./,PRNB5/122.83/,PRNC5/.4949/	DATA2200
	DATA PRNA6/.275/,PRNA7/.275/,PRNA8/1./,PRNB8/0./	DATA2210
	DATA PRNA9/1./,PRNB9/3.086/,PRNC9/.0577/,PRND9/4./,PRNE9/.36/	DATA2220
	DATA PRNF9/.075/,PRNG9/0./	DATA2230
	DATA PRNA10/5.1975/,PRNA11/1./,PRNB11/1.08/,PRNC11/2.543/	DATA2240
	DATA PRND11/.014/,PRNE11/.00002/,PRNF11/2./,PRNG11/0./	DATA2250
	DATA PRNA12/1./,PRNB12/1./,PRNC12/3125./,PRND12/.069/,PRNF12/0./	DATA2260
	DATA PRNA13/1./,PRNB13/.0001/,PRNC13/3125./,PRND13/.029/	DATA2270
	DATA PRNE13/0./	DATA2280
	DATA PRNA14/1./,PRNB14/.008166/,PRNC14/140./,PRND14/.333/	DATA2290
	DATA PRNE14/0./	DATA2300
	DATA PRNA15/1./,PRNB15/.02022/,PRNC15/140./,PRND15/.333/	DATA2310
	DATA PRNA16/1./,PRNB16/.001039/,PRNC16/198./,PRND16/.333/	DATA2320
	DATA PRNA17/1./,PRNB17/.001755/,PRNC17/4.6788/,PRNC17/2.809/,	DATA2330
	1 PRNE17/1.5487/	DATA2340
	DATA PRNA18/1./,PRNB18/0./,PRNA19/1./,PRNB19/1./,PRNC19/0./	DATA2350
	DATA PRNA20/1./,PRNB20/2040./,PRNC20/0./,PRNA21/1./,PRNB21/0./	DATA2360
	DATA PRNA22/1./,PRNB22/1./,PRNC22/0./,PRND22/2040.0/	DATA2370
	DATA PTP1,PTC1,PLC14/1.52,0.6,0.2608/	DATA2380
	DATA IPRCST,IGTYPE,ICTYPE/0,1,1/	DATA2390
	DATA NSCRC/C/	DATA2400
	DATA WTEUID,A/50.,1000./	DATA2410
	DATA WTEUID,KGTABL,KGTTYPE,DUMGX/0.,1,11,9*0./	DATA2420
	DATA S,QD,QA,R,IYEAR/1000.,20.,1., 1.,1974/	DATA2430
	DATA SAWTI/50.,100.,150./	DATA2440
	DATA SAWTJ/50.,100.,150./	DATA2450
	DATA SAFCI/10.,9.,8./	DATA2460
	DATA SAFCJ/20.,15.,10./	DATA2470
	DATA AWTI/150.,250.,350./	DATA2480
	DATA AWTJ/150.,250.,350./	DATA2490
	DATA APPEKI/40.,150.,250./	DATA2500
	DATA APPEKJ/40.,150.,250./	DATA2510
	DATA AFCI,AFCJ/9.,15./	DATA2520
	DATA KASTR,KAAGT,NACHN,KASGT/4*0/	DATA2530
	DATA KSASTR,KSAAGT,NSACHN,KSAAGT/4*0/	DATA2540
	DATA GIRWT/25.,50.,100./	DATA2550
	DATA GIRBSP/2.,2.,6./	DATA2560
	DATA GIRNDT/3*1./	DATA2570
	DATA GIRFC/2.,4.,11./	DATA2580
	DATA QMAXQ,VMAXQ,DUMQA/10*0.0/	DATA2590
	DATA PTR1/0.0/	DATA2591

END

DATA2600

```

SUBROUTINE DATA 2 ( I, JB, NB, NL, A, C, D, E, F, G)
C MODIFIED FEBRUARY 1972 GMCC
  DIMENSION A(15), C(15,15), D(15,15), NB(15), E(15,15), F(15,15),
  X(15,15)
  COMMON /DEVICE/ NDEV(12)
  EQUIVALENCE ( NDEV(5), N5 )
50 CONTINUE
  READ (N5,10) AA, JB, NL, CC, GG, FF, EE, DD
10  FORMAT(2X, A4, 2I2, 5A4 )
  READ(N5,30) ( A(N), N=1, NL )
30  FORMAT ( 10X, 6F10.0 )
  READ(N5,15) ( NB(N), N=1, NL )
15  FORMAT ( 20I2 )
55  DO 170 N = 1, NL
60  KL=NB(N)
  READ(N5,30) ( C(N,K), K=1, KL )
  DO TO ( 81, 75, 70, 65 ) , JB
65  READ(N5,30) ( G(N,K), K=1, KL)
70  READ(N5,30) ( F(N,K), K=1, KL)
75  READ(N5,30) ( E(N,K), K=1, KL)
81  READ(N5,30) ( D(N,K), K=1, KL)
170 CONTINUE
  RETURN
  END

```

DRDS0010
DRDS0020
DRDS0030
DRDS0040
DRDS0050
DRDS0060
DRDS0070
DRDS0080
DRDS0090
DRDS0100
DRDS0110
DRDS0120
DRDS0130
DRDS0140
DRDS0150
DRDS0160
DRDS0170
DRDS0180
DRDS0190
DRDS0200
DRDS0210
DRDS0220
DRDS0230
DRDS0240

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SUBROUTINE PAGE
C** PGM=XXX          L.D.GREGORY. VER.1 11-15-72. FORTRAN IV.  FBCD
  COMMON /INOUT/NLINE, NPAGE, PCODE(20), IDUM(108)
  COMMON /SECID/CLAS(20)
1000  FORMAT(/26X,19A4,A3/1H1,25X,19A4,A3/)
2000  FORMAT(6X,15A4,A3,6X, 4HPAGE,14/)
  WRITE( 6,1000) CLAS, CLAS
  WRITE( 6,2000) PCODE, NPAGE
  NPAGE = NPAGE + 1
  NLINE = 8
  RETURN
  END

```

PAGE0010
PAGE0020
PAGE0030
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PAGE0080
PAGE0090
PAGE0100
PAGE0110
PAGE0120

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SUBROUTINE RJINPT ( IZ4, NRAMPX, IPRIN, ITABL )
C OPTIONAL TABULAR READ OR NAMELIST READ
C NAMELIST READS AS STORED...WITH INDICES REVERSED FROM
C SYSTEM NORMAL STORAGE.....K,J,I, NOT IMJ,K
C REFORMATTED OUTPUT ..... NOT AS READ IN
  COMMON /ALTDD/
1K1, ALT(24), SDTEMP(24), PRESS(24), ID(8)
  COMMON /CODEXX/ II(16)
  EQUIVALENCE ( II(2), ITYPE )

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RJIN0010
RJIN0020
RJIN0030
RJIN0040
RJIN0050
RJIN0060
RJIN0070
RJIN0080
RJIN0090


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EQUIVALENCE ( II(8), NDUCT ), ( II(9), NFRNG )
COMMON /EXTERN/ EXTR14 (14), ASPECT, EXT X, DSMACH, DSHT, EXTR2(2)
COMMON /FUELXX/ K2, KK(15), TT2(15), FAR1(15,15), TRHI(15,15),
1 TRMED(15,15), TRLC(15,15),
2 K3, KL(15), JGAMM, TT4A(15), FAR2(15,15),
3 GAMLO(15,15), GAMMED(15,15), GAMHI(15,15),
4 K4, KN(15), JR, TT4B(15), FAR3(15,15),
5 GASLO(15,15), GASMED(15,15), GASHI(15,15),
6 NR1, BSP(24), COMEFF(24), RLEAN(24)
COMMON /INDATX/ THXX(23)
EQUIVALENCE (THXX(21), TSTART), (THXX(22), TFRNG)
COMMON /INDEX/ XINDO(16)
EQUIVALENCE ( XINDO(1), XR1 ), ( XINDO(2), XR2 ), ( XINDO(3), XR3 ),
1 ( XINDO(4), XR4 ), ( XINDO(5), XC ),
2 ( XINDO(6), YR1 ), ( XINDO(7), YR2 ),
4 ( XINDO(8), YR3 ), ( XINDO(9), YR4 ),
5 ( XINDO(10), YC ), ( XINDO(11), XT ),
6 ( XINDO(12), ZMACHT ), ( XINDO(13), YRANG1 ),
7 ( XINDO(14), YRANG2 ), ( XINDO(15), YRANG3 )
COMMON /INLETX/
6K8, KPTC(15), ALPHV(15), AAMACH(15,15), AQACC(15,15), PT3PTC(15,15),
1AQDD(15,15)
COMMON /NFILES/ N5, N6, N7, N11, N12, N1
COMMON /RJBLOK/ RJ(50)
EQUIVALENCE
1(RJ( 1), CNM ), (RJ( 2), ANC ), (RJ( 3), ANN ), (RJ( 4), AL ),
2(RJ( 5), PT2PD ), (RJ( 6), CDB ), (RJ( 7), C1 ), (RJ( 8), PT4X ),
3(RJ( 9), PT4Y ), (RJ(10), GAM ), (RJ(11), A6MAX ), (RJ(12), ACMAX ),
4(RJ(13), A6MIN ), (RJ(14), XMOMR ), (RJ(15), AQAC ), (RJ(16), CDA ),
5(RJ(17), DELT4 ), (RJ(18), PCMGN ), (RJ(19), AMACH ), (RJ(20), ALFCLD ),
6(RJ(21), A2A3 ), (RJ(22), FARLB ), (RJ(23), IFTYPE), (RJ(24), BPAR ),
7(RJ(25), ALF1 ), (RJ(26), TT4 ), (RJ(27), FAR ), (RJ(28), PM ),
8(RJ(29), WF ), (RJ(30), ANC4 ), (RJ(31), PT2PCC), (RJ(32), PTO ),
9(RJ(33), TO ), (RJ(34), PD ), (RJ(35), KDIA ), (RJ(36), PT4I ),
X (RJ(37), PT41 ), (RJ(38), PT42 ), (RJ(39), PT43 )
COMMON /RJITITL/ TITLE(20)
COMMON /TRAJX/ CFNET, CFNRQ, AMAXX, ALXX, MODES, IND, FARMAX, TT4MAX, FSLR
1, ICODE
C TABLE 2 TEMP RISE
C TABLE 3 GAMMA
C TABLE 4 GAS CONSTANT
C TABLE 5 BURNER SEVERITY TABLE, ANC AND LEAN BLOW OUT
C TABLE 6 INLET MAP
C IFTYPE = 0 FOR JP5 FUEL
C IFTYPE = 1 FOR HD-C OR BORON SLURRY
C READ AND WRITE TITLE, FUEL, TABLES, +INPUT DATA
C NAMELIST /NAMTRS/ KK, K2, TT2, FAR1, TRLO, TRMED, TRHI
NAMELIST /NAMSPH/ KL, K3, TT4A, FAR2, GAMLO, GAMMED, GAMHI
NAMELIST /NAMGSC/ KN, K4, TT4B, FAR3,
1 GASLO, GASMED, GASHI
NAMELIST /NAMBSP/ NR1, BSP, COMEFF, RLEAN
NAMELIST /NAMINM/ KPTC, K8, ALPHV, AAMACH, AQACC, PT3PTC,
1 ASPECT, DSHT, DSMACH, NDUCT, NFRNG, NRAMP,
2 TFRNG, TSTART, XC, XR1, XR2, XR3, XR4, XT, YC,
3 YR1, YR2, YR3, YR4, YRANG1, YRANG2, YRANG3, ZMACHT

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JPTC=3
IFF = 1
IF ( IFTYPE .GT. 0 ) IFF = 3
IF ( (IZ4.LT.56) .OR. (IZ4.GT.65) ) GO TO 66
57 IF ( IZ4 .NE. 57 ) GO TO 58
IF( ITABL.EQ.0) READ(N5,NAMTRS)
IF( ITABL.NE.0) CALL DATA2(1,3,
1      KK,K2,TT2,FAR1,TRHI,TRMED,TRLO,G)
IF ( IPRIN .LE. 0 ) GO TO 58
C WRITE TEMPERATURE RISE LIST
NONE=1
NTWO=2
NTHR=3
NFOR=4
DO 2959 MI = 1, K2, 4
WRITE ( N6, 2300 )
2300 FORMAT( // 50X,26HTEMPERATURE RISE DATA TABLES // )
WRITE(N6,2310) NONE, TT2(NONE), NTWO, TT2(NTWO)
2310 FORMAT(10X8HSUBTABLE , I4, 5X,6HTT2 =, F7.2,
1      35X8HSURTABLE , I4, 5X,6HTT2 =, F7.2 )
WRITE(N6,2315)
2315 FORMAT( 9X4HFAR1,8X4HTRLO, 11X5HTRMED, 11X4HTRHI,
1      18X4HFAR1,8X4HTRLO, 11X5HTRMED, 11X4HTRHI )
IKK = MAX0 ( KK(NONE), KK(NTWO) )
WRITE(N6,2320) ((FAR1(NONE,I), TRLO(NONE,I), TRMED(NONE,I),
1 TRHI(NONE,I), FAR1(NTWO,I), TRLO(NTWO,I), TRMED(NTWO,I),
2 TRHI(NTWO,I) ), I=1, IKK )
2320 FORMAT(5XF10.4, 3F15.4, 10XF10.4, 3F15.4 )
IF ( K2 .LT. NTHR ) CALL PAGE
IF ( K2 .LT. NTHR ) GO TO 2999
WRITE(N6,6325)
WRITE(N6,2310) NTHR, TT2(NTHR), NFOR, TT2(NFOR)
WRITE(N6,2315)
IKK = MAX0 ( KK(NTHR), KK(NFOR) )
WRITE(N6,2320) ((FAR1(NTHR,I), TRLO(NTHR,I), TRMED(NTHR,I),
1 TRHI(NTHR,I), FAR1(NFOR,I), TRLO(NFOR,I), TRMED(NFOR,I),
2 TRHI(NFOR,I) ), I=1, IKK )
NONE=NONE+4
NTWO=NTWO+4
NTHR=NTHR+4
NFOR=NFOR+4
CALL PAGE
2999 CONTINUE
58 IF ( IZ4 .NE. 58 ) GO TO 59
IF( ITABL.EQ.0) READ(N5,NAMSPH)
IF( ( ITABL.NE.0) .AND. ( IFF.EQ.3 ) ) CALL DATA2(1,IFF,
1      KL,K3,TT4A,FAR2,GAMHI,GAMMED,GAMLO,G)
IF( ( ITABL.NE.0) .AND. ( IFF.EQ.1 ) ) CALL DATA2(1,IFF,
1      KL,K3,TT4A,FAR2,GAMLO,GG1,GG2,G)
IF ( IPRIN .LE. 0 ) GO TO 59
C WRITE SPECIFIC HEAT LIST
NONE=1
NTWO=2
NTHR=3
NFOR=4

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RJIN0650
RJIN0660
RJIN0670
RJIN0680
RJIN0690
RJIN0700
RJIN0710
RJIN0720
RJIN0730
RJIN0740
RJIN0750
RJIN0760
RJIN0770
RJIN0780
RJIN0790
RJIN0800
RJIN0810
RJIN0820
RJIN0830
RJIN0840
RJIN0850
RJIN0860
RJIN0870
RJIN0880
RJIN0890
RJIN0900
RJIN0910
RJIN0920
RJIN0930
RJIN0940
RJIN0950
RJIN0960
RJIN0970
RJIN0980
RJIN0990
RJIN1000
RJIN1010
RJIN1020
RJIN1030
RJIN1040
RJIN1050
RJIN1060
RJIN1070
RJIN1080
RJIN1090
RJIN1100
RJIN1110
RJIN1120
RJIN1130
RJIN1140
RJIN1150
RJIN1160
RJIN1170
RJIN1180
RJIN1190

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DC 3999 MI = 1, K3, 4	RJIN1200
WRITE(N6,3300)	RJIN1210
3300 FORMAT(// 50X, 25HSPECIFIC HEAT DATA TABLES //)	RJIN1220
WRITE(N6,3310) NONE, TT4A(NONE), NTWO, TT4A(NTWO)	RJIN1230
3310 FORMAT(9X8HSUBTABLE, I4, 5X6HTT4A =, F7.2,	RJIN1240
1 35X8HSUBTABLE, I4, 5X6HTT4A =, F7.2)	RJIN1250
WRITE(N6,3315)	RJIN1260
3315 FORMAT(9X4PFAR2,9X5HGAMLO, 10X6HGAMMED, 9X5HGAMHI,	RJIN1270
1 17X4PFAR2,9X5HGAMLO, 10X6HGAMMED, 10X5HGAMHI)	RJIN1280
IKL = MAX0 (KL(NONE) , KL(NTWO))	RJIN1290
WRITE(N6,3320) ((FAR2(NONE,I), GAMLO(NONE,I), GAMMED(NONE,I),	RJIN1300
1 GAMHI(NONE,I), FAR2(NTWO,I), GAMLO(NTWO,I), GAMMED(NTWO,I),	RJIN1310
2 GAMHI(NTWO,I)), I= 1, IKL)	RJIN1320
3320 FORMAT(5XF10.4, 3F15.6, 10XF10.4, 3F15.6)	RJIN1330
IF (K3 .LT. NTHR) CALL PAGE	RJIN1340
IF (K3 .LT. NTHR) GO TO 3999	RJIN1350
WRITE(N6,6325)	RJIN1360
WRITE(N6,3310) NTHR, TT4A(NTHR), NFOR, TT4A(NFOR)	RJIN1370
WRITE(N6,3315)	RJIN1380
IKL = MAX0 (KL(NTHR) , KL(NFOR))	RJIN1390
WRITE(N6,3320) ((FAR2(NTHR,I), GAMLO(NTHR,I), GAMMED(NTHR,I),	RJIN1400
1 GAMHI(NTHR,I), FAR2(NFOR,I), GAMLO(NFOR,I), GAMMED(NFOR,I),	RJIN1410
2 GAMHI(NFOR,I)), I= 1, IKL)	RJIN1420
NONE=NONE+4	RJIN1430
NTWO=NTWO+4	RJIN1440
NTHR=NTHR+4	RJIN1450
NFOR=NFOR+4	RJIN1460
CALL PAGE	RJIN1470
3999 CONTINUE	RJIN1480
59 IF (I74 .NE. 59) GO TO 60	RJIN1490
IF(ITABL.EQ.0) READ(N5,NAMGSC)	RJIN1500
IF((ITABL.NE.0) .AND. (IFF.EQ.3)) CALL DATA2(1,IFF,	RJIN1510
1 KN,K4,TT4B,FAR3,GASHI,GASMED,GASLO,G)	RJIN1520
IF((ITABL.NE.0) .AND. (IFF.EQ.1)) CALL DATA2(1,IFF,	RJIN1530
1 KN,K4,TT4B,FAR3,GASLO,GG1,GG2,G)	RJIN1540
IF (IPRIN .LE. 0) GO TO 60	RJIN1550
C WRITE GAS CONSTANT LIST	RJIN1560
NONE=1	RJIN1570
NTWO=2	RJIN1580
NTHR=3	RJIN1590
NFOR=4	RJIN1600
DC 4999 MI=1,K4,4	RJIN1610
WRITE(N6,4300)	RJIN1620
4300 FORMAT(// 50X, 24HGAS CONSTANT DATA TABLES //)	RJIN1630
WRITE(N6,4310) NONE, TT4B(NONE),NTWO, TT4B(NTWO)	RJIN1640
4310 FORMAT(9X8HSUBTABLE, I4, 5X6HTT4B =, F7.2,	RJIN1650
1 35X8HSUBTABLE, I4, 5X6HTT4B =, F7.2)	RJIN1660
WRITE(N6,4315)	RJIN1670
4315 FORMAT(9X4PFAR3,10X5HGASLO, 10X6HGASMED, 10X5HGASHI,	RJIN1680
1 17X4PFAR3,10X5HGASLO, 10X6HGASMED, 10X5HGASHI)	RJIN1690
IKL = MAX0 (KN(NONE) , KN(NTWO))	RJIN1700
WRITE (N6,4320) ((FAR3(NONE,I), GASLO(NONE,I), GASMED(NONE,I),	RJIN1710
1 GASHI(NONE,I), FAR3(NTWO,I), GASLO(NTWO,I), GASMED(NTWO,I),	RJIN1720
2 GASHI(NTWO,I)) , I=1,IKL)	RJIN1730
4320 FORMAT(5XF10.4, 3F15.4, 10XF10.4, 3F15.4)	RJIN1740

IF (K4 .LT. NTHR) CALL PAGE	RJIN1750
IF (K4 .LT. NTHR) GO TO 4999	RJIN1760
WRITE(N6,6325)	RJIN1770
WRITE(N6,4310) NTHR, TT4B(NTHR),NFOR, TT4B(NFOR)	RJIN1780
WRITE(N6,4315)	RJIN1790
IKL = MAX0 (KN(NTHR) , KN(NFOR))	RJIN1800
WRITE (N6,4320) ((FAR3(NTHR,I), GASLO(NTHR,I), GASMED(NTHR,I),	RJIN1810
1 GASHI(NTHR,I), FAR3(NFOR,I), GASLC(NFOR,I), GASMED(NFOR,I),	RJIN1820
2 GASHI(NFOR,I)) , I=1,IKL)	RJIN1830
ACNE=NONE+4	RJIN1840
ATWO=NTWO+4	RJIN1850
NTHR=NTHR+4	RJIN1860
NFOR=NFOR+4	RJIN1870
CALL PAGE	RJIN1880
4999 CONTINUE	RJIN1890
60 IF (IZ4 .NE. 60) GO TO 61	RJIN1900
READ (N5, NAMRSP)	RJIN1910
IF (IPRIN .LE. 0) GO TO 61	RJIN1920
C WRITE BURNER SEVERITY LIST	RJIN1930
WRITE (N6, 5100)	RJIN1940
5100 FORMAT(/// 15X26BURNER SEVERITY DATA TABLE //	RJIN1950
1 / 17X3HBSP,9X6HCOMEFF,10X5HREAN /)	RJIN1960
WRITE (N6, 5200) ((BSP(NI),COMEFF(NI),REAN(NI)), NI=1,NR1)	RJIN1970
5200 FORMAT (5X, F15.2, F15.4, F15.5)	RJIN1980
CALL PAGE	RJIN1990
61 CONTINUE	RJIN2000
IF ((IZ4.NE.61).AND.(IZ4.NE.62)) GO TO 62	RJIN2010
NRAMP = NRAMPX	RJIN2020
READ (N5, NAMINM)	RJIN2030
XINDD(16) = DSMACH	RJIN2040
NRAMPX = NRAMP	RJIN2050
IF (IPRIN .LE. 0) GO TO 1111	RJIN2060
IF (ITYPE .EQ. 1) WRITE(N6, 545)	RJIN2070
IF (ITYPE .EQ. 2) WRITE(N6, 546)	RJIN2080
545 FORMAT(///10X,28HBELLY INLET DESIGN REQUESTED)	RJIN2090
546 FORMAT(///10X,31HDUAL AFT INLET DESIGN REQUESTED)	RJIN2100
WRITE(N6, 550) NRAMP, DSMACH, DSHT	RJIN2110
550 FORMAT(20X,8HPRAMPS - , I10/ 20X,8HSMACH - , F10.3/	RJIN2120
1 20X,8HALT - , F10.0 ///)	RJIN2130
C WRITE INLET SIZING TERMS	RJIN2140
WRITE(N6,570) ASPECT,ZMACH,NDUCT,NFRNG,TFRNG,TSTART,	RJIN2150
1 XR1,YR1,XR2,YR2,XR3,YR3,XR4,YR4,XC,YC,XT	RJIN2160
WRITE(N6,571) YRANG1, YRANG2,YRANG3	RJIN2170
570 FORMAT(/// 40X6HASPECT,F10.4/ 40X6HZMACH,F10.4/	RJIN2180
1 40X6HNDUCT ,I10/ 40X6HNFRNG ,I10/ 40X6HTFRNG ,F10.4/	RJIN2190
2 40X6HTSTART,F10.4/// 40X6HXR1,F13.4, 5X3HYR1,F10.4/	RJIN2200
3 40X6HXR2,F13.4, 5X3HYR2,F10.4/ 40X6HXR3,F13.4, 5X3HYR3,F10.4/	RJIN2210
4 40X6HXR4,F13.4, 5X3HYR4,F10.4/	RJIN2220
5 40X6HXC,F14.4, 5X2HYC,F11.4/ 40X6HXT,F14.4///)	RJIN2230
571 FORMAT(40X6HYRANG1,F10.4/ 40X6HYRANG2,F10.4/ 40X6HYRANG3,F10.4)	RJIN2240
1111 CONTINUE	RJIN2250
IF (IZ4 .NE. 62) GO TO 660	RJIN2260
KTEL=1	RJIN2270
CALL DATA2(KTEL,JPTC,KPTC,K8,ALPHV,AAMACH,ADDD,AQACC,PT3PTC,G)	RJIN2280
660 CONTINUE	RJIN2290

C	IF (IPRIN .LE. C) GO TO 62 WRITE INLET MAP - CRITICAL NONE=1 NTWO=2 NTHR=3 NFOR=4 CALL PAGE DO 6999 MI=1,K8,4 WRITE(N6,6300) 6300 FORMAT(// 45X, 20HINLET MAP - CRITICAL //) WRITE(N6,6310) NONE,ALPHV(NONE), NTWO,ALPHV(NTWO) 6310 FORMAT(9X,8HSURTABLE, I4,5X6HALPHV= ,F7.2, 1 35X,8HSURTABLE, I4,5X6HALPHV= ,F7.2 /) WRITE(N6,6315) 6315 FORMAT(9X6HAAMACH,8X4HADDD,12X5HADACC,9X6HPT3PTO, 1 15X6HAAMACH,8X4HADDD,12X5HADACC,9X6HPT3PTO) IKPT = MAX0 (KPTC(NONE), KPTC(NTWO)) WRITE(N6,6320) ((AAMACH(NONE,I),ADDD(NONE,I),AOACC(NONE,I), 1 PT3PTO(NONE,I), AAMACH(NTWO,I), ADDD(NTWO,I), AOACC(NTWO,I), 2 PT3PTO(NTWO,I)), I=1, IKPT) 6320 FORMAT(5XF10.4,F15.5,F15.5,F15.5, 10XF10.4,F15.5,2F15.5) IF (K8 .LT. NTHR) CALL PAGE IF (K8 .LT. NTHR) GO TO 6999 WRITE (N6,6325) 6325 FORMAT(//) WRITE(N6,6310) NTHR,ALPHV(NTHR), NFOR,ALPHV(NFOR) WRITE(N6,6315) IKPT = MAX0 (KPTC(NTHR), KPTC(NFOR)) WRITE(N6,6320) ((AAMACH(NTHR,I),ADDD(NTHR,I),AOACC(NTHR,I), 1 PT3PTO(NTHR,I), AAMACH(NFOR,I), ADDD(NFOR,I), AOACC(NFOR,I), 2 PT3PTO(NFOR,I)), I=1, IKPT) NONE = NONE + 4 NTWO = NTWO + 4 NTHR = NTHR + 4 NFOR = NFOR + 4 CALL PAGE 6999 CONTINUE 62 IF (IZ4.NE.63) GO TO 63 63 IF (IZ4.NE.64) GO TO 64 64 IF (IZ4 .NE.65) GO TO 66 66 CONTINUE RETURN END	RJIN2300 RJIN2310 RJIN2320 RJIN2330 RJIN2340 RJIN2350 RJIN2360 RJIN2370 RJIN2380 RJIN2390 RJIN2400 RJIN2410 RJIN2420 RJIN2430 RJIN2440 RJIN2450 RJIN2460 RJIN2470 RJIN2480 RJIN2490 RJIN2500 RJIN2510 RJIN2520 RJIN2530 RJIN2540 RJIN2550 RJIN2560 RJIN2570 RJIN2580 RJIN2590 RJIN2600 RJIN2610 RJIN2620 RJIN2630 RJIN2640 RJIN2650 RJIN2660 RJIN2670 RJIN2680 RJIN2690 RJIN2700 RJIN2710 RJIN2720
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C	SUBROUTINE SETUP1(IX,IZ5,KASE,IXX, Z3) PGM=NU6(CGSM) L.D.GREGORY, 3-53300. VER.2, 06-09-71.FORTRAN IV.ERCC TO READ COMPATIBILITY MATRICES COMMON /NFILES/ N5,N6,N7,N11,N12,N1 INTEGER*4 Z3 COMMON/CON1/INX(16),N0NCPT,NSSTYP,IL(30),NICOMA COMMON/S11/TITLE6(15),TITLE7(15),TITLE8(14) INTEGER*2 ICM COMMON/CSFT3/KAS ,LBVIX,LABVIX,MBVIX,MABVIX,NBV,NAUXV,IMBVIX(24)	SETU0010 SETU0020 SETU0030 SETU0040 SETU0050 SETU0060 SETU0070 SETU0080 SETU0090
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1,	PAUXV(16,10),BTC(4,30)	SFTU0100
2,	BVIX(24,16),NT(30),LART,MABT,NABT,NBT,BT(10,10,30)	SFTU0110
3,	ICM(16,16,1C)	SFTU0120
	COMMON/S13/MINX(7C),IR(70),IC(70),IS1(70),IS2(70)	SFTU0130
	COMMON/TEMP/JX1(70),JX2(70),JX3(70),JX4(70),RX1(70),RX2(70),	SFTU0140
1	RX3(70),RX4(70),JX(24)	SFTU0150
	DATA COMPAT/4HCOMP/	SFTU0160
CZAZA	COMMON/CZAZA/NCBA,IDA1,IDA2,IDA3,JZARL,LZA,MZA,ICA(16),CA(16)	SFTU0170
1,	TITLE(15),HEAD(37),IFMT	SFTU0180
2,	LAI,LAA1,MA1,MAA1,KAI(31,5),VAL(31,12) ,PADZA(77)	SFTU0190
	DIMENSION PZA(700)	SFTU0210
	EQUIVALENCE (NCBA,BZA(1))	SFTU0220
	COMMON/EASTAB/KZARL,KZARS	SFTU0230
2005	FORMAT(1H0,22HERROR IN SETUP1 AT E1=F8.2,(6X,5G12.5))	SFTU0240
C**		SFTU0250
C**	READ BASIC VARIABLES TABLE AND RECORD NSSTYP=NVAR & IL(1)=NO. OF EA.	SFTU0260
1	IY = 2	SFTU0270
	IDA1 = 2010000	SFTU0280
	KASE = IDA2	SFTU0290
	CALL RCBD11(BZA,LZA,MZA,NCBA,KZARL,[DA1,IDA2,IY,IXX])	SFTU0300
	NSSTYP = LA1	SFTU0310
	IF (IXX.EQ.0) GO TO 104	SFTU0320
	F1 = 1.06	SFTU0330
103	WRITE (N6,2005) E1,IDA1,IDA2	SFTU0340
	RETURN	SFTU0350
104	GO 105 I=1,NSSTYP	SFTU0360
105	IL(1) = KAI(I,5)	SFTU0370
C**		SFTU0380
C		SFTU0390
	IF (Z3 .GT. C) GO TO 1111	SFTU0400
C		SFTU0410
C**	GO READ COMPATIBILITY MATRIX INDEX	SFTU0420
11	CONTINUE	SFTU0430
	READ(N5,9000) NUMT, NUMC	SFTU0440
9000	FORMAT(12X, 17, 10X, 15)	SFTU0450
	READ(N5,1000) TITLE6, NICOMA	SFTU0460
1000	FORMAT(15A4, 110)	SFTU0470
	READ (N5,1000) TITLE7,NCNCPT	SFTU0480
12	READ (N5,1002) (JX1(I),JX2(I),JX3(I),I=1,8)	SFTU0490
1002	FORMAT(8(12,1X,12,1X,12,1X))	SFTU0500
C		SFTU0510
C	REINTERPRET, FIND DIMENSIONS, STORE IN MINX, IR, IC	SFTU0520
	DO 14 I=1,8	SFTU0530
	J= JX1(I)	SFTU0540
	K= JX2(I)	SFTU0550
	L= JX3(I)	SFTU0560
	IF((J.GT.NICOMA).OR.(J.LE.0)) GO TO 16	SFTU0570
	M= IL(K)	SFTU0580
	N= IL(L)	SFTU0590
	IF((M.NE.0).AND.(N.NE.0)) GO TO 13	SFTU0600
	M=0	SFTU0610
	N=0	SFTU0620
13	MINX(J)= K*10**6+L*10**4+M*100+N	SFTU0630
	IS1(J)=K	SFTU0640

IS2(J)=L	SETU0650
IR(J)=M	SETU0660
14 IC(J)=N	SETU0670
IF((J.NE.0).AND.(J.LT.NICOMA)) GO TO 12	SETU0680
C**	SETU0690
16 READ (N5,1010) (TITLE8(I),I=1,7),MX,(TITLE8(I),I=8,14),N	SETU0700
1010 FORMAT(6A4,A1,I5,10X,6A4,A1,I5)	SETU0710
IF(TITLE8(1).EQ.COMPAT) GO TO 18	SETU0720
STEP=16.02	SETU0730
WRITE (N6,2000) STEP	SETU0740
2000 FORMAT(1H0,5X,22HERROR IN SET1 AT STEP=,F10.2)	SETU0750
18 IF(N.EQ.NCNCPT) GO TO 20	SETU0760
STEP=18.01	SETU0770
WRITE (N6,2000) STEP	SETU0780
20 I1=IR(MX)	SETU0790
I2=IC(MX)	SETU0800
DO 22 J=1,I1	SETU0810
22 READ (N5,1012) (ICM(J,K,MX),K=1,I2)	SETU0820
1012 FORMAT(10X,14I5)	SETU0830
IF(MX.LT.NICOMA) GO TO 16	SETU0840
RETURN	SETU0850
1111 CONTINUE	SETU0860
NICOMA = -1	SETU0870
NCNCPT = 0	SETU0880
RETURN	SETU0890
END	SETU0900

SUBROUTINE SETUP3(IX,I75,KASS,IPR,NLINE,NPAGE,PCCDF,IXX)	SETU0870
C PGM=NU6(CCSM) L.D.GREGORY, 3-53300. VER.2, 05-25-71.FORTRAN IV.ERCD	SETU0880
C SUBROUTINE PURPOSE. RETRIEVE TYPE 2 TABLES FROM BASIC TABLE FILE,	SETU0890
C (DISK 11) AND STORE IN CORE FOR USE.	SETU0900
C PGM=NU6(CCSM) R.K.MCDONOUGH 35240C 2/29/72 F-IV/ERCD	SETU0910
C IX = Z4 = 1, INITIAL SETUP. PRINT IF IPR=IPR(5)= 1.	SETU0920
C = 2, PRINT ONLY, SEE IPR	SETU0930
C IPR = IPR(5) = 1, PRINT BORDERED TABLE ONLY	SETU0940
C IPR = IPR(5) = 2, PRINT BORDERED TABLE ONLY + AUX	SETU0950
C IPR = IPR(5) = 3, PRINT BORDERED TABLE ONLY + AUX + IMBVIX	SETU0960
C I75 = UNUSED	SETU0970
C KASS = KASE = CASE NUMBER, USED TO RETRIEVE SPECIFIC TABLES	SETU0980
C IXX = 0, TABLES SET UP WITH NO ERROR	SETU0990
C =.GT.0 TABLES NOT SET UP, OR A TABLE NOT FOUND	SETU1000
C IN COMMON/CSFT3/	SETU1010
C KASE = KASS	SETU1020
C BVIX(,) = BASIC VARIABLES INDEX.	SETU1030
C LBVIX,MBVIX ARE ABSOLUTE DIMENSIONS OF BVIX. LBVIX,MBVIX SPECIFIC.	SETU1040
C NBV = LBVIX - NAUXV = NO. BASIC VARIABLES.	SETU1050
C NAUXV = LBVIX - NBV = NO. AUXILIARY VARIABLES	SETU1060
C IMBVIX(I) = LENGTH OF ROW 'I' IN BVIX(I,J).	SETU1070
C FAUXV(,)= AUXILIARY TABLE, TRANSPOSE OF LAST ROWS OF BVIX(,)	SETU1080
C WITH COL LENGTHS INSERTED IN FIRST ROW.	SETU1090
C BT(, ,K) = BORDERED TABLE 'K', I.E. LAYER K.	SETU1100
C NT(J) = K = LAYER IN WHICH 'JTH' TABLE IS FOUND (J=1,NBT).	SETU1110
C NBT = NO. OF BORDERED TABLES STORED IN BT(, ,).	SETU1120

C	LABT, MART, NABT = ABSOLUTE DIMENSIONS OF BT.	SFTU1130
	COMMON /NFILES/ N5,N6,N7,N11,N12,N1	SFTU1140
	COMMON /BASTAB/KZARL,KZARS	SFTU1150
CZAZA		SFTU1160
	COMMON /CZAZA/NCBA,IDA1,IDA2,IDA3,JZARL,LZA,MZA,ICA(16),CA(16)	SFTU1170
	1, TITLA(15),HEAD(37),IFMT	SFTU1180
	2, LA1,LAAL,MA1,MAAL,KAL(31,5),VAL(31,12) ,PADZA(77)	SFTU1190
	DIMENSION BZA(700)	SFTU1200
	EQUIVALENCE (NCBA,BZA(1))	SFTU1210
	COMMON /CSFT3/KASE,LRVIX,LARVIX,MBVIX,MABVIX,NBV,NAUXV,IMBVIX(24)	SFTU1220
	1, BAUXV(16,10),BTC(4,30)	SFTU1230
	2, RVIX(24,16),NT(30),LABT,MART,NABT,NBT,BT(10,10,30)	SFTU1240
	3, XXXX(1280)	SFTU1250
	DIMENSION NID(30),PCODE(20),IDUM(1,1)	SFTU1260
	DATA NID/30*0/	SFTU1270
2005	FORMAT(1H0,22HERROR IN SETUP3 AT E1=F8.2,(6X,5G12.5))	SFTU1280
2006	FORMAT(6X,27HIN SETUP3, TABLE NOT FOUND= (6X,5G12.5))	SFTU1290
2007	FORMAT(/6X, 7HIMBVIX= /(6X,10G12.5))	SFTU1300
C**		SFTU1310
C**	INITIALIZE	SFTU1320
1	IXX = 0	SFTU1330
	GO TO (2,40) ,IX	SFTU1340
2	KASE = KASS	SFTU1350
	KASE = IDA2	SFTU1360
	LARVIX = 24	SFTU1370
	MARVIX = 16	SFTU1380
	LABT = 10	SFTU1390
	MART = 10	SFTU1400
	NABT = 30	SFTU1410
	NRT = 0	SFTU1420
	NBV = 0	SFTU1430
	DO 8 I=1,NABT	SFTU1440
8	NT(I) = 0	SFTU1450
C**	READ BASIC VARIABLES INDEX AND STORE	SFTU1460
	ID1 = 2010000	SFTU1470
	ITRANS = 1	SFTU1480
10	IY = 3	SFTU1490
	IXY = 0	SFTU1500
	CALL RCBD11(BZA,LZA,MZA,NCBA,KZARL,ID1, KASE,IY,IXY)	SFTU1510
	IF (IXY.EQ.0) GO TO 12	SFTU1520
	IF (NLINE .LT. 60) GO TO 1000	SFTU1530
	CALL PAGE	SFTU1540
	NPAGE = NPAGE + 1	SFTU1550
	NLINE = 9	SFTU1560
1000	CONTINUE	SFTU1570
	IF (IPP .LE. 0) GO TO 1234	SFTU1580
	WRITE (N6,2006) ID1,KASE	SFTU1590
	NLINE = NLINE + 1	SFTU1600
1234	CONTINUE	SFTU1610
	IF (ITRANS.EQ.1) RETURN	SFTU1620
	IXX = IXX + 1	SFTU1630
	GO TO 24	SFTU1640
12	GO TO (14,26) , ITRANS	SFTU1650
14	LRVIX = LA1	SFTU1660
	MBVIX = MA1	SFTU1670

	GO 16 I=1,LRVIX	SETU1680
	IMBVIX(I) = KA1(I,5)	SETU1690
	GO 16 J=1,MRVIX	SETU1700
16	PVIX(I,J) = VA1(I,J)	SETU1710
C**	TRANSFER AUXILIARY VARIABLES	SETU1720
	GO 18 I=1,LRVIX	SETU1730
	IL = I	SETU1740
	IF (KA1(I,5).LT.0) GO TO 19	SETU1750
18	CONTINUE	SETU1760
	IL = LRVIX	SETU1770
19	CONTINUE	SETU1780
	I = IL - 1	SETU1790
	NRV = MAX(0,I)	SETU1800
	NAUXV = LRVIX - NRV	SETU1810
	IF (NAUXV .LE. 0) GO TO 5678	SETU1820
	GO 21 J=1,NAUXV	SETU1830
	BAUXV(I,J) = -IMBVIX(J + NRV) + 1	SETU1840
	K = BAUXV(I,J) + .001	SETU1850
	GO 21 I=2,K	SETU1860
21	PAUXV(I,J) = VA1(J+NRV,I-1)	SETU1870
C**	FILL 3-DIM BORDERED TABLES BT(, ,)	SETU1880
5678	CONTINUE	SETU1890
	ITRANS = 2	SETU1900
	K = 0	SETU1910
24	K = K + 1	SETU1920
	IF (K.GT.NABT) GO TO 32	SETU1930
	ID1 = NID(K)	SETU1940
	IF (ID1.LE.0) GO TO 24	SETU1950
	GO TO 10	SETU1960
26	NRT = K	SETU1970
	NT(K) = K	SETU1980
	L = VA1(1,1) + .01	SETU1990
	M = MOD(L,100)	SETU2000
	L = L / 100	SETU2010
	GO 28 I=1,L	SETU2020
	GO 28 J=1,M	SETU2030
28	PT(I,J,K) = VA1(I,J)	SETU2040
	GO 29 I=1,4	SETU2050
29	RTC(I,K) = CA(4*I)	SETU2060
	GO TO 24	SETU2070
32	IF (IPR.EQ.0) RETURN	SETU2080
C**		SETU2090
C**	WRITE BORDERED TABLES	SETU2100
40	K = 0	SETU2110
42	K = K + 1	SETU2120
	IF (K.GT.NABT) GO TO 44	SETU2130
	KT = NT(K)	SETU2140
	IF (KT.LE.0) GO TO 42	SETU2150
	L = BT(1,1,KT) + .01	SETU2160
	M = MOD(L,100)	SETU2170
	L = L / 100	SETU2180
	CALL WMAT3(2,IDUM,BT,LABT,MABT,NABT,L,M,KT,NLINE,NPAGE,PCODE,	SETU2190
1	60HORDERED TABLE FROM SETUP3 - PGM=CGSM	SETU2200
	GO TO 42	SETU2210
C**	WRITE AUXILIARY VARIABLES	SETU2220

44	IF (IPR.LE.1) RETURN	SETU2230
	VAR = 0.0	SETU2240
	CALL WRITRX(BAUXV,MABVIX, 10,MABVIX,NAUXV,VAR,IXY,NLINE,NPAGE,	SETU2250
	1PCODE,	SETU2260
	2 60HAUXILIARY VARIABLES AND RANGES FROM SETUP3 - PGM=CGSM	SETU2270
	IF (IPR.LE.2) RETURN	SETU2280
	WRITE (N6,2007) IMBVIX	SETU2290
	RETURN	SETU2300
	END	SETU2310

	SUBROUTINE SORTCM	SORT0010
C	NUK,CM-CGSM R.K.MCDONOUGH FIV/EBCD 10/18/73	SORT0020
C		SORT0030
	COMMON/CON1/INX(16),NCNCP,NSSTYP,IL(30),NICOMA	SORT0040
	COMMON/CSET3/KASE,LBVIX,LBVIIX,MBVIX,MABVIX,NBV,NAUXV,IMBVIX(24)	SORT0050
	1, BAUXV(16,10),BTC(4,3C)	SORT0060
	2, BVIX(24,16),NT(30),LABT,MABT,NABT,NBT,BT(10,10,30)	SORT0070
	3, XXXX(1280)	SORT0080
	DIMENSION ID1(2000),ID2(2000)	SORT0090
	EQUIVALENCE (BT(1),ID1(1)),(ID1(2001),ID2(1))	SORT0100
	COMMON/FILING/ KONPL,KSAVPL,KONBS	SORT0110
	COMMON/INQU12/JD12,ND12,NR12	SORT0120
	INTEGER ZIP,ZCODE,Z1,Z2,Z3,Z4,Z5,Z6,Z7,Z8,Z9	SORT0130
	COMMON/INOUT/NLINE,NPAGE,PCODE(20),MISC(7),XMISC(7),ZIP,ZCODE(19)	SORT0140
	1, JRASH(20),TRASH(20),IP(8),IC(8),DUM(8),IDUM(8),NFLAG,NFLAG2	SORT0150
	EQUIVALENCE (ZCODE(1),Z1),(ZCODE(2),Z2),(ZCODE(3),Z3)	SORT0160
	1, (ZCODE(4),Z4),(ZCODE(5),Z5),(ZCODE(6),Z6)	SORT0170
	2, (ZCODE(7),Z7),(ZCODE(8),Z8),(ZCODE(9),Z9)	SORT0180
	COMMON/LEVEL1/NSYST,EFF(2000),COST(2000),NSYS(2000),NLEVT,	SORT0190
	1, NSTOP(99),EFFL(2000),COSTL(2000),NSYSL(2000)	SORT0200
	COMMON /NFILES/ N5,N6,N7,N11,N12,N1	SORT0210
	COMMON /SCREEN/ NLEVEL,LTM1,LTM2,LEVLOP,NCONOP, NUT74(4)	SORT0220
	COMMON /SY1/MCODE(6),NCONES,NCONFG	SORT0230
	EQUIVALENCE (KASE,KAS), (NCONFG,JCONFG)	SORT0240
C		SORT0250
	DIMENSION TAPE(100)	SORT0260
	EQUIVALENCE (TAPE(1), NCONXX), (TAPE(2), WTTOT),	SORT0270
1	(TAPE(3), WWING), (TAPE(4), RCR),	SORT0280
3	(TAPE(5), ACR), (TAPE(6), VCR),	SORT0290
4	(TAPE(7), WORTH), (TAPE(8), WTAIL),	SORT0300
4	(TAPE(9), RLL), (TAPE(10), ALL),	SORT0310
5	(TAPE(11), VLL), (TAPE(12), CEP),	SORT0320
6	(TAPE(13), PLMASS), (TAPE(14), PLLT),	SORT0330
7	(TAPE(15), RANGE), (TAPE(16), FORCE),	SORT0340
8	(TAPE(17), SUSW), (TAPE(18), SUSL),	SORT0350
9	(TAPE(19), RELIB), (TAPE(20), WPROPS),	SORT0360
	EQUIVALENCE (TAPE(21), BOOW), (TAPE(22), BOOL),	SORT0370
B	(TAPE(23), WPROPB), (TAPE(24), XLTOT),	SORT0380
C	(TAPE(25), WTH1), (TAPE(26), WTH2),	SORT0390
C	(TAPE(27), WM), (TAPE(28), XLM),	SORT0400
E	(TAPE(29), WP), (TAPE(30), DEXIT),	SORT0410
F	(TAPE(31), WINERT), (TAPE(32), PMF),	SORT0420
G	(TAPE(33), WN), (TAPE(34), WPOVWC),	SORT0430

H	(TAPE(35), XLPS) , (TAPE(36), WPROPI) ,	SOFT0440
I	(TAPE(37), XLTF) , (TAPE(38), WF) ,	SOFT0450
J	(TAPE(39), XLTOX) , (TAPE(40), WOX) ,	SOFT0460
K	(TAPE(41), WFTANK) , (TAPE(42), WCXTAK) ,	SOFT0470
L	(TAPE(43), XLTP) , (TAPE(44), WTP) ,	SOFT0480
M	(TAPE(45), ACA3) , (TAPE(46), HC)	SOFT0490
	EQUIVALENCE (TAPE(47), WTSP) , (TAPE(48), ASA3) ,	SOFT0500
1	(TAPE(49), WC) , (TAPE(50), WFMB) ,	SOFT0510
2	(TAPE(51), A6A3) , (TAPE(52), WTINLT) ,	SOFT0520
3	(TAPE(53), WTNOZ) , (TAPE(54), AC) ,	SOFT0530
4	(TAPE(55), XLE) , (TAPE(56), CDC) ,	SOFT0540
5	(TAPE(57), CLA)	SOFT0550
	EQUIVALENCE (TAPE(81), AWING), (TAPE(82), ATAIL) ,	SOFT0560
1	(TAPE(85), WWW) , (TAPE(86), WGC) ,	SOFT0570
2	(TAPE(87), DIAM)	SOFT0580
C		SOFT0590
	KDL = KSAVPL	SOFT0600
	NCON = MINO (KDL, NCONFG)	SOFT0610
	IF (NCON.GT.0) GO TO 1C	SOFT0620
	WRITE (N6,3008) KASE	SOFT0630
3008	FORMAT(6X,12H-CASE NUMBER=,I12,26H, NO CONFIGURATIONS FOUND)	SOFT0640
	RETURN	SOFT0650
10	CONTINUE	SOFT0660
	WTM1=FLOAT(LTM1)	SOFT0670
	WTM2=FLOAT(LTM2)	SOFT0680
	IF (NLEVEL .LT. 1) NLEVEL = 1	SOFT0690
	NLDEL = 1	SOFT0700
	CALL PAGE	SOFT0710
	WRITE (N6, 5517)	SOFT0720
5517	FORMAT(/// SX,34H-CONCEPT WORTH COST LENGTH RANGE ,	SOFT0730
1	3X34HRCR RRI DIAM WW/H WEIGHT VCR)	SOFT0740
	GO 100 ICON = 1, NCON	SOFT0750
	JD12 = ICON	SOFT0760
	READ (N12,JD12) TAPE	SOFT0770
	NSYS(ICON) = ICON	SOFT0780
	COST(ICON)=TAPE(100)	SOFT0790
	XCOST=TAPE(100)	SOFT0800
	FFF(ICON) = (WTH1*WTM1 + WTH2*WTM2) / (WTM1 + WTM2)	SOFT0810
	WORTH = FFF(ICON)	SOFT0820
	NLINE = NLINE + NLDEL	SOFT0830
	IF (NLINE .LT. 50) GO TO 3017	SOFT0840
	CALL PAGE	SOFT0850
	NLINE = NLINE + NLDEL	SOFT0860
	WRITE (N6, 5517)	SOFT0870
3017	CONTINUE	SOFT0880
	NCONFG = ICON	SOFT0890
	WRITE(N6,5518) NCONFG,WORTH,XCOST,XLTOT,RANGE,RCR,	SOFT0900
1	RLL,DIAM,WWW,WTTOT,VCR	SOFT0910
5518	FORMAT(SX,15,F8.2,F8.0,F7.1,3F6.1,F5.1,F6.0,F8.0,F6.2)	SOFT0920
100	CONTINUE	SOFT0930
	NSYST = NCON	SOFT0940
	NLEVT = NLEVEL	SOFT0950
	CALL LEVCM	SOFT0960
C		SOFT0970
C	OUTPUT FOR TOP LEVEL CONFIGURATIONS	SOFT0980

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      IF ( (LEVLOP.LE.0) .OR. (NCONOP.LE.0) ) GO TO 2200
C     TOP LEVLOP LEVELS OR TOP NCONOP CONFIGURATIONS
      ICOUNT = 1
      K1 = 1
      LQ = LEVLOP
      IF ( LEVLOP .GT. NLEVT ) LQ = NLEVT
      DO 2100 I = 1, LQ
      K2 = NSTOP(I)
      DO 2080 K = K1, K2
      CALL PAGE
      KZ = NSYSL(K)
      JDI2 = KZ
      WRITE ( N6, 5519 ) I
5519  FORMAT ( /// 11X,8H***** / 2X5HLEVEL, 4X1H*, I5, 1X1H* )
      IXXY = 1
      CALL HACKCM ( IXXY, KCONFG, KZ )
C
      IF ( ICOUNT .GE. NCONOP ) GO TO 2200
      ICOUNT = ICOUNT + 1
2080  CONTINUE
      K1 = K2 + 1
2100  CONTINUE
2200  CONTINUE
C     OUTPUT SUMMARY DATA BY LEVEL
      ICOUNT = 1
      K1 = 1
      LQ = NLEVT
      DO 4100 I = 1, LQ
      K2 = NSTOP(I)
      CALL PAGE
      WRITE(N6,4911) I
4911  FORMAT(/// 10X17H-SUMMARY FOR LEVEL   , I5 )
      WRITE(N6,5517)
      DO 4080 K = K1, K2
      KZ = NSYSL(K)
      JDI2 = KZ
      READ(N12,JDI2) TAPE
      WORTH = ( WTH1*WTM1 + WTH2*WTM2 ) / ( WTM1 + WTM2 )
      XCOST=TAPE(100)
      ACNXX=TAPE(1)
      WRITE(N6,5518)NCONXX,WORTH,XCOST,XLTOT,RANGE,RCR,RLI,CIAM,WWH,
      1 WTTOT,VCR
4080  CONTINUE
      K1=K2+1
4100  CONTINUE
      RETURN
      END

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SORT0990
 SORT1000
 SORT1010
 SORT1020
 SORT1030
 SORT1040
 SORT1050
 SORT1060
 SORT1070
 SORT1080
 SORT1090
 SORT1100
 SORT1110
 SORT1120
 SORT1121
 SORT1130
 SORT1140
 SORT1150
 SORT1160
 SORT1170
 SORT1180
 SORT1190
 SORT1200
 SORT1201
 SORT1202
 SORT1203
 SORT1204
 SORT1205
 SORT1206
 SORT1207
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 SORT1211
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 SORT1217
 SORT1218
 SORT1219
 SORT1220
 SORT1221
 SORT1222
 SORT1230
 SORT1240

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      SUBROUTINE CMGSM ( NIT, KRET )
C     NUK.CM-CGSM P.K.MCDONOUGH FIV/EBOD 10/18/73
C     KIND = 10 SOLID ROCKET
C     KIND = 20 LIQUID ROCKET
C     KIND = 41 INTEGRAL ROCKET RAMJET

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CMGS0010
 CMGS0020
 CMGS0030
 CMGS0040
 CMGS0050

C	KIND = 43 EXTERNAL BOOSTED RAMJET	CMGS0060
C	KIND = 44 UNBOOSTED RAMJET	CMGS0070
C	ISIZE = 1 LENGTH IS INPUT	CMGS0080
C	ISIZE = 2 WEIGHT IS INPUT	CMGS0090
C	NCOP IS NUMBER OF TRAJECTORY POINTS	CMGS0100
C	KSUS TYPE SUSTAINER	CMGS0110
C	KFM TYPE OF FUEL MANAGEMENT SYSTEM	CMGS0120
C	ITYPE 1 BELLY INLET	CMGS0130
C	ITYPE 2 DUAL AFT INLET	CMGS0140
C	INDUCT IS INLET MATERIAL CODE	CMGS0150
C	NFRNG IS FAIRING MATERIAL CODE	CMGS0160
C	PCINT(X,1) ALTITUDE	CMGS0170
C	PCINT(X,2) MACH NUMBER	CMGS0180
C	PCINT(X,3) ACCN NORMAL ACCEL	CMGS0190
C	PCINT(X,4) ACCT TANGTL ACCEL	CMGS0200
C	PCINT(X,5) GAMMA FLIGHT PATH ANGLE	CMGS0210
C	PCINT(X,6) FRACTN FRACTION FUEL CONSUMED	CMGS0220
C	COMMON GENERAL	CMGS0230
	COMMON/BASTAR/KZARL,KZARS	CMGS0240
	COMMON /CONSTA/ RE,TWOPI,GM , PI, RAD,FPNM,RENM,WE	CMGS0250
	COMMON /CMOPT/ KBYDRG,KBYPAK,KBYPSM,KBYVP	CMGS0260
1	KRYMOT, INWORL , KFILL2	CMGS0270
	COMMON /FILING/ KONPL, KSAVPL, KEND	CMGS0280
	COMMON /GUIDCO/ GUVAR(60)	CMGS0290
	EQUIVALENCE (GUVAR(2), NSCRC)	CMGS0300
	DIMENSION IPRP(4)	CMGS0310
	COMMON/INDU1/IPR(16),JPAR(16),PAR(16)	CMGS0320
	EQUIVALENCE (IPR , IPRP)	CMGS0330
	EQUIVALENCE (IPR(10), IAIR), (IPR(11), IPACK),	CMGS0340
1	(IPR(12), IPSM), (IPR(13), IVP)	CMGS0350
	COMMON/INDU11/JD11,ND11,NB11,INDX11(100,7)	CMGS0360
	COMMON / INDU12 / JD12,ND12, NB12	CMGS0370
	INTEGER ZIP,ZCODE,Z1,Z2,Z3,Z4,Z5,Z6,Z7,Z8,Z9	CMGS0380
	COMMON/INDU1/NLINE,NPAGE,PCODE(20),MISC(7),XMISC(7),ZIP,ZCODE(19)	CMGS0390
1	JPASH(20),TRASH(20),IR(8),IC(8),DUM(8),IDUM(8),NFLAG,NFLAG2	CMGS0400
	EQUIVALENCE (ZCODE(1),Z1),(ZCODE(2),Z2),(ZCODE(3),Z3)	CMGS0410
1	, (ZCODE(4),Z4),(ZCODE(5),Z5),(ZCODE(6),Z6)	CMGS0420
2	, (ZCODE(7),Z7),(ZCODE(8),Z8),(ZCODE(9),Z9)	CMGS0430
	COMMON /INDU11/ LABEL	CMGS0440
	COMMON /NFILES/ N5,N6,N7,N11,N12,N1	CMGS0450
	COMMON /SCREEN/NLEVEL,NWF1,NWF2,LDES,NDES,LPERF,NPERF,LSAV,NSAV	CMGS0460
	EQUIVALENCE (NLEVEL, LEVELS), (LDES, NLOUT)	CMGS0470
1	, (NDES, NCOUT)	CMGS0480
	DIMENSION PVCEP(7),DWCEP(7),PVRMAX(7),DWRMAX(7),	CMGS0490
1	PVNO(7),DWNO(7),PVREL(7),DWREL(7),DWTWH(7),PVWTH(7),	CMGS0500
2	PVRCR(7),DWRCR(7),PVRL(7),DWRLL(7),PVHCR(7),DWHCR(7),	CMGS0510
3	PVHLL(7),DWHLL(7),PVVCR(7),DWWCR(7),PVVLL(7),DWWLL(7)	CMGS0520
	COMMON /SCRN1/ NPTS(20),PARVNL(7,20),DWNL(7,20),DUMMY(50)	CMGS0530
1	, NSCOST, IDU4M4(4)	CMGS0540
	EQUIVALENCE (IDU4M4(1), KBYCST)	CMGS0550
	EQUIVALENCE (IDU4M4(3), ICOST)	CMGS0560
	EQUIVALENCE	CMGS0570
1	(NPTS(1),NCEP),	CMGS0580
2	(NPTS(2),NRMAX),	CMGS0590
3	(NPTS(3),NNO),	CMGS0600

4 (NPTS(4),NREL),	CMGS0610
5 (NPTS(5),NWTWH),	CMGS0620
6 (NPTS(6),NRGR),	CMGS0630
7 (NPTS(7), NRLL),	CMGS0640
8 (NPTS(8),NHCR),	CMGS0650
9 (NPTS(9),NHLL),	CMGS0660
A (NPTS(10),NVCR),	CMGS0670
B (NPTS(11),NVLL)	CMGS0680
EQUIVALENCE	CMGS0690
A (PVCEP(1), PARVNL(1,1)),	CMGS0700
1 (PVRMAX(1), PARVNL(1,2)),	CMGS0710
2 (PVND(1), PARVNL(1,3)),	CMGS0720
3 (PVREL(1), PARVNL(1,4)),	CMGS0730
4 (PVWTWH(1),PARVNL(1,5)),	CMGS0740
5 (PVRGR(1), PARVNL(1,6)),	CMGS0750
6 (PVRL(1), PARVNL(1,7)),	CMGS0760
7 (PVHCR(1), PARVNL(1,8)),	CMGS0770
8 (PVHLL(1), PARVNL(1,9)),	CMGS0780
9 (PVVCR(1), PARVNL(1,10)),	CMGS0790
A (PVVLL(1), PARVNL(1,11))	CMGS0800
EQUIVALENCE	CMGS0810
1 (DWCEP(1), DWNL(1,1)),	CMGS0820
2 (DWPMAX(1), DWNL(1,2)),	CMGS0830
3 (DWND(1), DWNL(1,3)),	CMGS0840
J(DWREL(1), DWNL(1,4)),	CMGS0850
5 (DWWTWH(1), DWNL(1,5)),	CMGS0860
6 (DWRGR(1), DWNL(1,6)),	CMGS0870
7 (DWRLL(1), DWNL(1,7)),	CMGS0880
8 (DWHCR(1), DWNL(1,8)),	CMGS0890
9 (DWELL(1), DWNL(1,9)),	CMGS0900
A (DWVCR(1), DWNL(1,10)),	CMGS0910
B (DWVLL(1), DWNL(1,11))	CMGS0920
COMMON /SECIO/ SECUR(20)	CMGS0930
COMMON /SUPERB/ KSYSTEM, KLNCH, KFUEL	CMGS0940
COMMON /SY1 / NCODE(6), NCODES, NCONF	CMGS0950
COMMON /SWORTH/KBASE, WORTH1, WORTH2, NPAR, KPAR(20), PARV(20)	CMGS0960
1, DERV1(20),DERV2(20)	CMGS0970
COMMON /TUB/ BCLR,CLRA,CLRF,DEL VX,FCLR,GCLR,KMAIR,	CMGS0980
1 PAKSUR,RATCLR, REHTUB,THEAD, THERST, TURTHK,	CMGS0990
2 KMTAIL, WINGCL, WTMAX, XLTMX, DTUBMX, XLBMX, ZPYLON	CMGS1000
COMMON /ZWORTH/ ZCEP(10), ZFORCE, ZGWT (10), ZREL, ZWCTH(10)	CMGS1010
EQUIVALENCE (ZWOTH(1), NZLLRI)	CMGS1020
COMMON PAYLOAD	CMGS1030
COMMON /SEVEN/ ITNX,APHI,CLR, IRADAR,IPAY,DANT,XLVCID,WFO,WMISC,	CMGS1040
1 RHOWH,PHOEQ,EQCLR,WHCLR,XLMISC,XLEQ,XLWH,	CMGS1050
2 IAPTX,NWX,IARWX,PIVOT,INTYPE,XLPAYI,WPAYI,WWH,XLEHT,	CMGS1060
3 XLEW,XLEVT,XLET,EXTRSV(25)	CMGS1070
DIMENSION XX1(20)	CMGS1080
COMMON /XINFRT/ XX5(5),WARRAY(20),XX1,PANWW,XX4(4),PANWHT,	CMGS1090
1 XXX4(4),PANWVT,XX29(29),PARRAY(20),XX12(12),PANWT,XXX1,BRAT,	CMGS1100
2 THETAC,XX11(11)	CMGS1110
COMMON ADM	CMGS1120
COMMON /AFRO/ X91(93),SLET, X10(10), BRAZ, XXXZ	CMGS1130
EQUIVALENCE (XDIT, X91(58))	CMGS1140
COMMON /AERPRO/ ZDDDES(10), ZLADES(10)	CMGS1150

COMMON /AERZ/ AERZ9(9),FRBTX,FRB,NAERX(30)	CMGS1160
COMMON /AFTAR/ ARVT,TRVT,BVT,RCVT,TCVT,TANSVT	CMGS1170
1 , STEVT, GGMIS(7)	CMGS1180
COMMON /BYAIR/ SREF,SMACH1(20),SMACH2(20),SMACH3(20),SMACH4(20),	CMGS1190
1 SMACH5(20), CLALF1(20),CLALF2(20),CLALF3(20),CLALF4(20),	CMGS1200
2 CLALF5(20), DMACH1(20),DMACH2(20),DMACH3(20),DMACH4(20),	CMGS1210
3 DMACH5(20), CDD1(20,5),CDD2(20,5),CDD3(20,5),CDD4(20,5),	CMGS1220
4 CDD5(20,5)	CMGS1230
COMMON /DRG/ XAZ2(2),FINE,XAZ7(7),ITN,AM5(5),IBTL,AZM73(3),	CMGS1240
1 ITSECT,IWSECT,RXINT,RXINW,ARV9(9),DE,UMPT(2),NW,DZ4(4),	CMGS1250
2 APT,ARW,TRT,TRW,ZSXC2(2)	CMGS1260
COMMON /FIXUP/ FIX2(2), RMLD,RMHI,FX6(6)	CMGS1270
COMMON /FORNOW/ NRM,NALT,RMV(20),ALTV(10),FRBT,FACTCP	CMGS1280
COMMON /HINC/ RHLTX, RHLW	CMGS1290
COMMON /LEFT/ SFT3(3),SET,SFT2(2),RL4,RL5,SFF2(2),IART,	CMGS1300
1 ICNTRL,XZ2X(2)	CMGS1310
COMMON /NAERC/ TNAZZL	CMGS1320
P ,STF,STET,TRAT,SWE,TRAW,DCASE,DEOD,ARL6,AL5X,XMSX,	CMGS1330
Q STEW, XSTA,FSCVCW,FSCVCT,WMISS,SMRL,SMRH,WWING,IARW,	CMGS1340
R IPLDT,NCCVAR	CMGS1350
S ,PHLT,TNZZL,TLTHEO	CMGS1360
COMMON /ROLL/ RNW,RNT,IARWQ,BWH,BTH	CMGS1370
COMMON /SURFX/ RMDER,WOG,GULT,IWTS,WWINGI,WTI,WQVAW,WQVAHT,	CMGS1380
1 WQVAVT,WQVAT,WXW3(3), VTALOC, WXW5(5)	CMGS1390
2 ,SLEW,SLEVT,ISURFW,IPLANW,ISURFT,IPLANT	CMGS1400
COMMON PSM	CMGS1410
COMMON /ADDON/ SPPWF,FF(19)	CMGS1420
COMMON /ALL/ ALL12(12),IMCD, ALL16(16)	CMGS1430
COMMON /RESYET/ ZYNB, BES14(14)	CMGS1440
COMMON /CODEBT/ IFIRST,JRJ,J	CMGS1450
COMMON /CODEXX/ KPROP,KINLET,ISIZE,NODP,KSUS,KFM,IPSTIN,	CMGS1460
1 NDUCT,NFRNG,II3(3),IEX,NPASS,NOUT,IXXN	CMGS1470
EQUIVALENCE (II3(1), NZTEMP)	CMGS1480
COMMON /DAM/ DIAFR,DAMISC(19)	CMGS1490
COMMON /DESIGN/ DES9(9), PCNFDS, PRFDS, ETAFDS, DES12(12), T4DS,	CMGS1500
1 DES2(2), ETARDS, DEX12(12), TELPDS, CALPDS, ETLPDS, DES37(37)	CMGS1510
COMMON /DESOPT/ KENG,KTANK,KIZQ,METTJ,ISTR,IDIFF, DES19(19)	CMGS1520
COMMON /EXTERN/ EXT6(6),VL,VEOB,EXT3(3),A3,EXIT,	CMGS1530
1 TANLT,AX,EXTX,XMRJTO,HEIGHT,EXT2(2)	CMGS1540
COMMON/EXXRJ/ EX(48)	CMGS1550
EQUIVALENCE	CMGS1560
1 (EX(3),TEXT),(EX(4),TTHROT),	CMGS1570
2(EX(5),TENT),(EX(6),RHOEXT),(EX(7),RHOTHT),(EX(8),RHOENT),	CMGS1580
3(EX(9),TEXTET),(EX(10),RHOX),(EX(11),TMINC),(EX(12),TMIND),	CMGS1590
4(EX(13),FL),(EX(14),FSULT),(EX(15),FSYLD),(EX(16),TINS),	CMGS1600
5(EX(17),RHOIN),(EX(18),XSTAR),(EX(19),CLEAR),(EX(20),C1),	CMGS1610
6(EX(21),C2),(EX(22),C3),(EX(23),C4),(EX(24),C5),	CMGS1620
7(EX(25),C6),(EX(26),TINAFI),(EX(27),WRJ),(EX(28),XRJ),	CMGS1630
8(EX(29),TEMPC),(EX(30),MTLRAM)	CMGS1640
COMMON /EMPT/ HP,AMACH,ALF1,FARD	CMGS1650
COMMON /FRONT/ FR63(63), HPEXT, FR16(16)	CMGS1660
COMMON /FSB/ HPEXX, FSB8(8)	CMGS1670
COMMON /GOROL/ WARD (78)	CMGS1680
EQUIVALENCE (WARD(1), D), (WARD(2), PC),	CMGS1690
1 (WARD(3), FJ), (WARD(4), PA),	CMGS1700

2	(WARD(5),	F1), (WARD(6),	PBELL),	CMGS1710
3		(WARD(8),	GAM),	CMGS1720
4	(WARD(9),	RHCP), (WARD(10),	AFAT),	CMGS1730
5	(WARD(11),	CSTAR), (WARD(12),	PCM),	CMGS1740
6	(WARD(13),	FSYLX), (WARD(14),	FSULX),	CMGS1750
7	(WARD(15),	TMIN), (WARD(16),	TCASEF),	CMGS1760
8	(WARD(17),	BETA), (WARD(18),	CASEM),	CMGS1770
9	(WARD(19),	DM), (WARD(20),	ETAX),	CMGS1780
A	(WARD(21),	DLFS), (WARD(22),	TTH),	CMGS1790
B	(WARD(23),	FCWM), (WARD(24),	FER),	CMGS1800
C	(WARD(25),	RBOSS), (WARD(26),	DENI),	CMGS1810
D	(WARD(27),	FIT), (WARD(28),	FBM),	CMGS1820
E	(WARD(29),	RMIW), (WARD(30),	SAW),	CMGS1830
	EQUIVALENCE	(WARD(31),	RMFW), (WARD(32),	VRFH),
G		(WARD(33),	RMFSW), (WARD(34),	FSL),
H		(WARD(35),	FSWM), (WARD(36),	SEM),
I		(WARD(37),	RMASW), (WARD(38),	ASL),
J		(WARD(39),	ASWM), (WARD(40),	GMAX),
K		(WARD(41),	ASM), (WARD(42),	AER),
L		(WARD(43),	EAR), (WARD(44),	RMAW),
M		(WARD(45),	AIT), (WARD(46),	TL),
N		(WARD(47),	FMPAH), (WARD(48),	ABM),
P		(WARD(49),	RMCW), (WARD(50),	PNBWM),
Q		(WARD(51),	RNTM), (WARD(52),	RNECC),
R		(WARD(53),	RNRM), (WARD(54),	RNTWM),
S		(WARD(55),	RNEC), (WARD(56),	RNEC1),
T		(WARD(57),	RNEC2), (WARD(58),	RNEC3),
U		(WARD(59),	RNMW), (WARD(61),	FPT),
V		(WARD(62),	PSUB), (WARD(63),	RHORH)
	COMMON /INDATX/	THX20(20),TSTART,TFRNG,TXHX		CMGS2000
	COMMON /INPTTJ/	FNOND, ALFTX, AMOMD, T404D, INP20(20)		CMGS2010
	EQUIVALENCE	(INP20(1), SKSTR), (INP20(5),RHOTJ),		CMGS2020
X		(INP20(6), PEHTJ),		CMGS2030
1		(INP20(9), TJLMIS), (INP20(10), WSTRI),		CMGS2040
2		(INP20(11), WQVATJ), (INP20(12), XLDIFI)		CMGS2050
3		, (INP20(13), WMISTJ)		CMGS2060
	COMMON /ITERT/	DVTOL,DELDEL,NUMIT,MAXNIT,DVMULT		CMGS2070
	COMMON/MOOL/	OD(30)		CMGS2080
	EQUIVALENCE	(TSKINI,OD(1)), (TCWI, OD(2)), (TFRAC,OD(3)),		CMGS2090
1	(SAFAC, OD(4)),	(IWTANK,OD(5)), (WSKNPL, OD(6)),		CMGS2100
2	(WPAYL, OD(7)),	(IWTPL,OD(8)), (WSINPU, OD(9)), (WCVAST, OD(10)),		CMGS2110
3	(DBT, OD(11))			CMGS2120
	EQUIVALENCE	(OD(12), ITANK)		CMGS2130
	COMMON /NAMSOL/	DXZ,XISPHI,DXZ3(3), WMSOL,DX33(3),		CMGS2140
1	TOWDES, TRATIO, ITHR, FDES			CMGS2150
	COMMON /PAKER/	PK(48)		CMGS2160
	EQUIVALENCE			CMGS2170
1	(PK(13),PKD)			CMGS2180
1	(PK(1),CLX),(PK(2),NB),(PK(3),X2),(PK(4),X1)			CMGS2190
	EQUIVALENCE	(PK(14), VPP)		CMGS2200
	COMMON /PINT/	FFX3(3),PCHI,ETACF,EXPBR,PHINOR,PBELS,RHOMTL,		CMGS2210
1	RHOINL,SIGMTL,REFH,APAT,RHOS,XISPLC,			CMGS2220
2	RHOISS,ATAT,TIC, REAH,PS, ZUMW10(10)			CMGS2230
	COMMON /RJBLOK/	RJ(50)		CMGS2240
	EQUIVALENCE	(RJ(10), GAMRJX)		CMGS2250

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EQUIVALENCE ( RJ(26), TT4 ) CMGS2260
EQUIVALENCE ( RJ(1),CNM),(RJ(3),ANN),(RJ(4),AL),(RJ(6),CDB), CMGS2270
1 ( RJ(11),A6MAX),(RJ(12),ACMAX),(RJ(13),A6MIN), CMGS2280
2 ( RJ(14),XMMR),(RJ(17),DELT4),(RJ(18),FCMGN), CMGS2290
3 ( RJ(23),IFTYPE),(RJ(37),PT41),(RJ(38),PT42), CMGS2300
4 ( RJ(39),PT43) CMGS2310
COMMON /ROCKET/ XISPTH,XMRT,ETAI SP, PCHAMB, FENG, ETACL, PRELL,
1 P1,P2,P3,P4,P5,P6,P7,P8,PSTAR, PT, WOVAC2, EXS1, WCVAC1, DULU, CMGS2320
2 WOVAN1, WOVAN2, RHOOX, PVOX, REH, METAL, ROC5(5), CMGS2340
3 WMISCL, RHOF, ITHL, TOWDEL, TRATIL, FDEL, XOLMIS CMGS2350
COMMON /SEPOWR/ SP(48) CMGS2360
EQUIVALENCE CMGS2370
1 (SP( 1),WTSP ),(SP( 2),VOLSP ) CMGS2380
COMMON /SOLMIS/ CSTAR1, CSTAR2, ETSISP, DUM7(7) CMGS2390
COMMON /SUSDAT/ TX(44) CMGS2400
EQUIVALENCE CMGS2410
1(TX( 1), EXIN ),(TX( 2),DROF ),(TX( 3),EDR ),(TX( 4),FFXP ), CMGS2420
2(TX( 5), GMF ),(TX( 6),PDF ),(TX( 7),PN2 ),(TX( 8),RGN ), CMGS2430
3(TX( 9), ROB ),(TX(10),RHORJF),(TX(11),TFUEL ),(TX(12),RU ), CMGS2440
4(TX(13), SULTN ),(TX(14),TRLAD ),(TX(15),THGG ),(TX(16),TSUS ), CMGS2450
5(TX(17), ULLG ),(TX(18),TCASEC),(TX(19),TMAX ),(TX(20),PCC ), CMGS2460
6(TX(21), WDFMAX),(TX(22),XFMB ),(TX(23),WFC ),(TX(24),WFMR ), CMGS2470
7(TX(25), SUSMLT),(TX(26),SUSMWT),(TX(27),FMIN ),(TX(28),DFLWT ), CMGS2480
8(TX(29), DELLT ),(TX(30),DELF ),(TX(31),SWTOLD),(TX(32),SLTOLD), CMGS2490
9(TX(33), SUSLT ),(TX(34),SUSWT ),(TX(35),FTUS ),(TX(36),FTYS ), CMGS2500
1(TX(37), SMLT ),(TX(38),SMWT ),(TX(39),FMINT ),(TX(40),FUSABL), CMGS2510
2(TX(41), RHC ),(TX(42),RHOINS),(TX(43),MATTK),(TX(44),MATPB) CMGS2520
COMMON /TRAJX/ CFN6(6), FARMAX, TT4MAX, CFN2(2) CMGS2530
EQUIVALENCE ( CFN2(1), FSLBO ) CMGS2540
COMMON /TRJDTA/ ZPALT(10), ZPMACH(10), ZPNACC(10), ZPTACC(10), CMGS2550
1 ZPGAM(10), ZPERFU(10), ZPTTFA(10) CMGS2560
COMMON /TURPI/ TV(30) CMGS2570
EQUIVALENCE ( TV(1), WAFGDS ), (ALFTJ, TV(2) ) CMGS2580
COMMON /UPINLT/ PRAMBL(129), XCGD1 CMGS2590
COMMON /WATIN/ WAT5(5), TJMMAX,NEXEX,OPR,WAT3(3), YEAR,ZSCALE CMGS2600
COMMON VPM CMGS2610
DIMENSION ZPRINT(20) CMGS2620
EQUIVALENCE ( FUSY(1), ZPRINT(1) ) CMGS2630
COMMON /PERF/ KBY2(2),VELI,XMACHI,GAMMAI,ALTI,MOPT,ALPHAZ, CMGS2640
1 NCPHAZ,NOPHAZ,XMACHE(20),ALTF(20),GAMMAF(20),FVALUE(20), CMGS2650
A CONI1 (10), CONI2 (10), CONI3 (10), CONI4 (10), CONI5 (10), CMGS2660
B CONI6 (10), CONI7 (10), CONI8 (10), CONI9 (10), CONI10(10), CMGS2670
C CONI11(10), CONI12(10), CONI13(10), CONI14(10), CONI15(10), CMGS2680
D CONI16(10), CONI17(10), CONI18(10), CONI19(10), CONI20(10), CMGS2690
E COND1 (10), COND2 (10), COND3 (10), COND4 (10), COND5 (10), CMGS2700
F COND6 (10), COND7 (10), COND8 (10), COND9 (10), COND10(10), CMGS2710
G COND11(10), COND12(10), COND13(10), COND14(10), COND15(10), CMGS2720
H COND16(10), COND17(10), COND18(10), COND19(10), COND20(10), CMGS2730
2 ITERM(20), NAERO(20), CMGS2740
3 IPTYPE(20),MODES(20),MHGEN(20),ICONT(20) CMGS2750
4 , ALPMAX(20),ANZMAX(20),FUSY(20) CMGS2760
DIMENSION CONDZ(400) CMGS2770
EQUIVALENCE ( CONDZ(1), CONI1(1) ) CMGS2780
COMMON /MULTRJ/ NTRAJ,TRCON(670,5), XLBDY, XNDZ CMGS2790
1 , TRMOR(102,5), KEMTY CMGS2800

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DIMENSION TREFIX(102)	CMGS2810
EQUIVALENCE (TREFIX(1), DALPH)	CMGS2820
DIMENSION TRYSDM(670)	CMGS2830
EQUIVALENCE (TRYSDM(1), KBY2(1))	CMGS2840
EQUIVALENCE (TSKINI, ZSKINI)	CMGS2850
COMMON /NEWVPM/ DALPH,DALT,DCFN,DELMAX, DHCL,DMACH,CMIN,DSTART,	CMGS2860
C DVCL,FREF,ERRFAC,IPROP1, JPRINT,MXSTEP,NTRY5,RANGE1,RTOL,	CMGS2870
D TIME1,GKG,GKV,GKVCRU,GTOPT,SLOPE(20),TPHASE(20),TTOTAL(20),	CMGS2880
E PMORE(20)	CMGS2890
EQUIVALENCE (PMORE(1), TPCMGN)	CMGS2900
COMMON /TOVPER/ BODWP,BISPV,BTHVAC,BEXIT,SUSWP,SEXIT,BCANTA,	CMGS2910
1 WTINIT,DROPST,DROPEB,KIND,A5A3,A6A3,ACA3,D3,	CMGS2920
2 TVACMX,TVACMN,YISP(20),XTHRTL(20),EXTRA(15)	CMGS2930
COMMON/VERT/ SVTSPF, BARVT, TANQVT, TAN2VT, TAN4VT,	CMGS2940
1 ACVT, ATN2VT, ATCVT, AMACVT, TMACVT, BTANVT,	CMGS2950
2 BDCVT, TRTPV1, BAPPVT, BAPVT, FLVTST, XLENVT,	CMGS2960
3 CFVT, TRAVT, RXINVT, FSOVVT	CMGS2970
	CMGS2980
C NL FOR GENERAL	CMGS2990
NAMLIST /NAM1/ IAIR, INPRIN, IPACK, IPRP, IPSM, IVP,	CMGS3000
1 KFIL12, NPAGE	CMGS3010
2 , ICOST	CMGS3020
NAMLIST/NAM2/NPARV,KPARM,KASE,PARM,KASEA,PARMA,KASEB,PARMB,	CMGS3030
1 NPARTS,PLVL1,PLVL2,RLVL1,RLVL2	CMGS3040
DATA RLVL1,RLVL2,RLVL1,RLVL2/16.667,50.,10.,30./	CMGS3050
NAMLIST /NAM3/ WORTH1, NRMAX, PVRMAX,DWRMAX,NWTWH,PVWTH,	CMGS3060
1 DWWTWH, NROR,PVRCR,DWROR, NRLL,PVRL1,DWRLL,	CMGS3070
2 NHCR,PVHCR,DWHCR, NHLL,PVHLL,DWHLL, NVCR,PVVCOR,DWVCR,	CMGS3080
3 NVLL,PVLL,DWLL, NCEP,PVCEP,DWCEP, NREL,PVREL,DWREL,	CMGS3090
4 NNO,PVNO,DWNO	CMGS3100
5 , ZCFP, ZFORCE, ZGWT, ZREL	CMGS3110
NAMLIST/NAM4/KBASE,KPARM,PARM,WORTH1,WORTH2,RDER1,RDER2	CMGS3120
NAMLIST /NAMPAK/ BCLR,CLRA,CLRF,DELX,FCLR,GCLR,KMAIR,	CMGS3130
1 PAKSUB,RATCLR, REHTUB,THEAD,THEBST,TURTHK,	CMGS3140
2 KMTAIL, WINGCL, WTMAX, XLTMX, DTUBMX, XLTBMX, ZPYLON	CMGS3150
3 , KLNCH	CMGS3160
NAMLIST /NAMBY/ KBYORG, KBYPK, KBYPSM, KBYVP,	CMGS3170
A ACA3,A5A3,A6A3, BEXIT,BISPV,BODWP,BTHVAC,	CMGS3180
1 DROPEB,DROPST, SEXIT,SUSWP, TVACMN,TVACMX, XTHRTL,YISP,	CMGS3190
2 SMACH1, SMACH2, SMACH3, SMACH4, SMACH5,	CMGS3200
3 CLALF1, CLALF2, CLALF3, CLALF4, CLALF5,	CMGS3210
4 DMACH1, DMACH2, DMACH3, DMACH4, DMACH5,	CMGS3220
5 CDO1,CDO2,CDO3,CDO4,CDO5, CDDDES, CLADES,	CMGS3230
6 XLPCY, XNOZ , XCGD1	CMGS3240
7 , KBYCST	CMGS3250
NAMLIST /NAMSCR/ LEVELS, NCOU, NLOU	CMGS3260
NAMLIST /NAMCNF/ ALTV,ARVT, FACTOR,FSOVCT,FSOVOW,FSOVVT,	CMGS3270
1 GULT,ILUG,IPLANT,IPLANW,IWTS,NALT,NRM,	CMGS3280
X PANWHT,PANWT,PANWVT,RL5,RMDES,RMV,	CMGS3290
2 RXINT,RXINVT,RXINW,SLET,SLEW,SLEVT,STET,STEVT, STEW,THETAC,	CMGS3300
A TRAT, TRAVT, TRAW,	CMGS3310
3 TRT,TRVT,TRW, VTALOC,WQVAHT, WQVAST,WQVAT,WQVAVT,WQVAW,	CMGS3320
4 WTI, WINGI	CMGS3330
5 , ZPOPT, ZWSKIN	CMGS3340
6 ,RMLO,RMHI,SMRL,SMRH	CMGS3350

7	, ZSK INI	CMGS3360
C NL	FOR PSM	CMGS3370
	NAMLIST /NAMBD00/ ARM,AER,AFAT,AIT, ASL,ASM,ASWM,	CMGS3380
1	CASEM,CSTAR, DENI,DLFS, EAR,EPI,ETAX, FRM,FCWM,	CMGS3390
2	FER,FIT,FJ, FMPAH,FSL, FSULX,FSWM,FSYLX, GAM,GMAX,	CMGS3400
3	PA,PBELL,PC,PCM, PHI,PSUB, RBOSS,RHOP, RMASW,	CMGS3410
4	RMAW,RMCW,RMFSW,RMFW, RMIW, RNBWM,RNEC, RNECC,RNEC1,	CMGS3420
5	RNEC2,RNEC3,RNMW,RNRM,RNTM,RNTWM,SAW,SEM,TCASEF,	CMGS3430
6	TL,TMIN,TTH,VRFH	CMGS3440
	NAMLIST /NAMEXB/ C1,C2,C3,C4,C5,C6,CLEAR, EL,	CMGS3450
1	MTLRM, RHOENT,RHOEXT, RHOIN,RHOTHT,RHOX,	CMGS3460
2	TEMPC,TENT,TEXT, TEXTER,THETA, TINAFT,	CMGS3470
3	TINS,TMNC, TMIND, TTHROT, WHARNS, XSTAR	CMGS3480
	NAMLIST /NAMSR/ AIAT,APAT, ETACF,EXPRR,	CMGS3490
1	PBELS, PHINOZ, REAH,REFH, RHOISS,RHOMTL,RHOS,	CMGS3500
2	SIGMTL,TIC, TRATIO, WMSOL	CMGS3510
4	, ETSISP, CSTAR1, CSTAR2	CMGS3520
	NAMLIST /NAMLR/ DBT, ETACL, ETAISP, EXS1, ITANK, IWTANK,	CMGS3530
1	METAL,P1,P2,P3,P4,P5,P6,P7,P8,PBFLLL, PSTAR,PT,PVCX,	CMGS3540
2	REP,RHOF,RHOX,SAFAC,TCWI,TERAC,TRATIL,WMISCL,	CMGS3550
3	WOVAC1,WOVAC2,WOVAN1,WOVAN2, XCLMIS	CMGS3560
	NAMLIST /NAMRJS/ A6MAX,A6MIN,ACMAX, AL,ANN, CDB,CLX,CNM,	CMGS3570
1	DELT4,DRDF, EDR,EEXP,EXIN, FSLBO,FTUS,FTYS,	CMGS3580
2	GME, IFTYPE, MATPR, MATTK, NB,	CMGS3590
3	PDF,PKD,PN2,PT41,PT42,PT43,	CMGS3600
4	RGD,RHOINS, RHORJE, ROB, RU, SPPWF, TANLT,TRLAD,	CMGS3610
5	TCASEC, TFUEL, THGG,TMAX, TSUS,	CMGS3620
6	ULLG, VPP, X1, X2, XMOMR	CMGS3630
	NAMLIST /NAMTJ/ ALFTJ, CNLPDS, ETABDS, ETAFDS, ETLPDS,	CMGS3640
1	HPEXT, IDIFF, IMCO, ISTR, KENG, SKSTR, KTANK,	CMGS3650
2	MFTTJ, TJMMAX, OPR, PCNFDS, PRFDS, REHTJ,	CMGS3660
3	RHOTJ, TELPDS, TJLMIS, WMISTJ, WCVATJ, WSTRI,	CMGS3670
4	XLDIFI, YEAR	CMGS3680
C NL	FOR VPM	CMGS3690
	NAMLIST /NAMVPM/ ALPMA,ALTF,ANZMAX,FVALUE,GAMMAF,	CMGS3700
1	ICONT, IPTYPE, ITERM, MHGEN, MODES, NAERO, XMACHF,	CMGS3710
2	CONI1, CONI2, CONI3, CONI4, CONI5, CONI6, CONI7,	CMGS3720
3	CONI8, CONI9, CONI10, CONI11, CONI12, CONI13, CONI14,	CMGS3730
4	CONI15, CONI16, CONI17, CONI18, CONI19, CONI20,	CMGS3740
5	COND1, COND2, COND3, COND4, COND5, COND6, COND7, COND8,	CMGS3750
6	COND9, COND10, COND11, COND12, COND13, COND14, COND15,	CMGS3760
7	COND16, COND17, COND18, COND19, COND20	CMGS3770
8	, ZPRINT	CMGS3780
9	,ALTI, FARMAX, GAMMAI, MOPT, NCPHAZ,NOPHAZ, NLPHAZ, NZLLRI,	CMGS3790
A	TT4MAX, VELI, XMACHI, TPCMG	CMGS3800
B	, DALPH,DALT,DCFN,DELMAX, DHCL,DMACH,DMIN,DSTART,	CMGS3810
C	DVCL,FRPF,FRPFAC,IPROP1, JPRINT,MXSTEP,NTRY, RANGEI,RTOL,	CMGS3820
D	TIMEI,GKG,GKV,GKVCUR,GTOPT,SLOPE,TPHASE,TTOTAL	CMGS3830
	NAMLIST /SUPER/ ALTI, ART, BCANTA, PRAT,	CMGS3840
1	DIAFR,	CMGS3850
2	DVMULT,DVTOL, FARMAX,FINE, FRBT,GAMMAI,	CMGS3860
3	IART,IARW,IBTL, ICNTRL, INWORL, ISURFT,ISURFW,	CMGS3870
A	ITP,	CMGS3880
4	ITN, ITSECT, IWSECT,	CMGS3890
5	KFUEL, KINLET,KLNCH, KPROP,	CMGS3900

6	MAXNIT, MOPT, NCPHAZ, NDPHAZ, NLPHAZ, NW,	CMGS3910
7	NZLLRI, NZTEMP, TT4MAX,	CMGS3920
8	VELI, VEOB, VL, WMISC, XMACHI	CMGS3930
X	, ZXNR, TPCMG	CMGS3940
R	, XLBDY	CMGS3950
	NAMLIST /NMAA/ KBYDRG, KBYPK, KBYPSM, KBYVP, ACA3, A5A3, A6A3, BEXIT,	CMGS3960
1	RISPV, BOOWP, RTHVAC, DROPEB, DROPST, SEXIT, SUSWP, CDDDES,	CMGS3970
2	CLADES, XLBDY, XNOZ	CMGS3980
	NAMLIST /NAMAB/ TVACMN, TVACMX, XTHRTL, YISP	CMGS3990
	NAMLIST /NAMAC/ SMACH1, SMACH2, SMACH3, SMACH4, SMACH5,	CMGS4000
1	CLALF1, CLALF2, CLALF3, CLALF4, CLALF5	CMGS4010
	NAMLIST /NAMAD/ DMACH1, DMACH2, DMACH3, DMACH4, DMACH5,	CMGS4020
1	CDD1, CDD2, CDD3, CDD4, CDD5	CMGS4030
CFCRMTS		CMGS4040
1000	FORMAT(1X, 15A4, A3)	CMGS4050
1002	FORMAT(A4, 3I2, I10, 4I5, 10A4)	CMGS4060
2002	FORMAT(/6X, A4, 3I2, I10, 4I5, 10A4)	CMGS4070
2005	FORMAT(1H0, 20HERROR IN MAIN AT E1=, F8.2, 3X, A4, 3I2, I10, 4I5, 10A4)	CMGS4080
C		CMGS4090
	NLIX = NLINE	CMGS4100
C		CMGS4110
C		CMGS4120
	IF (NIT .GT. 0) GO TO 6001	CMGS4130
C		CMGS4140
	NIT = 1	CMGS4150
	CALL INVRT	CMGS4160
	NPAGE = 3	CMGS4170
	NTABL = 0	CMGS4180
	KRJE=0	CMGS4190
	NPAP = 0	CMGS4200
	KPASVA = 1	CMGS4210
	KFYDRG = 0	CMGS4220
	ICNST = -1	CMGS4230
	INPRN = 1	CMGS4240
	KBYPK = 1	CMGS4250
	KBYPSM = 0	CMGS4260
	KBYVP = 0	CMGS4270
	KPYMOI = 1	CMGS4280
	KSYSTEM = 1	CMGS4290
	KLNCH = 1	CMGS4300
	KFIJEL = 1	CMGS4310
	INWORL = 0	CMGS4320
	KFIL12 = 0	CMGS4330
	IAIR=-1	CMGS4340
	IPACK=0	CMGS4350
	IPSM=-1	CMGS4360
	IVP=-1	CMGS4370
	CDDDES=0.0	CMGS4380
	CLADES=0.0	CMGS4390
	XLDIFI=0.	CMGS4400
	WMISC=0.0	CMGS4410
	MAXNIT=3	CMGS4420
	MOPT=1	CMGS4430
	CRDF=0.000001	CMGS4440
	NALT=3	CMGS4450

NRM=6
 ALTV(1)=0.
 ALTV(2)=40000.
 ALTV(3)=100000.
 RMV(1)=.4
 RMV(2)=.9
 RMV(3)=1.
 RMV(4)=1.5
 RMV(5)=2.
 RMV(6)=4.
 XLBDY = 0.
 XNOZ = 0.
 SMRL=-.5
 SMRH=-.5
 RMLD=.8
 RMHI=2.
 XCGD1=5.
 RL4=0.
 XSTA=0.
 RFLW=0.
 RFLT=0.
 TCASEF=900.
 ZSKINI = .4
 TPCMGN=3.
 GAMRJX = 1.4
 DO 5297 IZ = 1, 10
 IZIZ = IZ + 10
 ZPRINT(IZ) = 0.
 ZPRINT(IZ IZ) = 0.
 ZCEP(IZ) = .01
 ZGWT(IZ) = 1000.
 5297 CONTINUE
 ALFTJ = 0.
 ZGWT(1) = 0.
 ZREL = .95
 ZFORCE = 100.
 N7LLRI=0
 N7TEMP=0
 NSFLAF=1
 NSFLPS=1
 NSFLTA=1
 NSFLTR=1
 NSELWI=1
 CPERFU=0.0
 CPNACC = 0.
 CPTACC = 0.
 KPY2(1) = 0
 KPY2(2) = 0
 WHARNS = 0.
 PHINOZ=15.
 TRAVT = .05
 FSDVVT = 0.
 STEVT = 0.
 RXINVT = .5
 ARVT=.99

CMGS4460
 CMGS4470
 CMGS4480
 CMGS4490
 CMGS4500
 CMGS4510
 CMGS4520
 CMGS4530
 CMGS4540
 CMGS4550
 CMGS4560
 CMGS4570
 CMGS4580
 CMGS4590
 CMGS4600
 CMGS4610
 CMGS4620
 CMGS4630
 CMGS4640
 CMGS4650
 CMGS4660
 CMGS4670
 CMGS4680
 CMGS4690
 CMGS4700
 CMGS4710
 CMGS4720
 CMGS4730
 CMGS4740
 CMGS4750
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 CMGS4890
 CMGS4900
 CMGS4910
 CMGS4920
 CMGS4930
 CMGS4940
 CMGS4950
 CMGS4960
 CMGS4970
 CMGS4980
 CMGS4990
 CMGS5000

TRVT=.4	CMGS5010
RAD = 57.29578	CMGS5020
IPTL = NAERX(2)	CMGS5030
ILUG = NAERX(3)	CMGS5040
CIAFR = 1.	CMGS5050
VPP = 10.	CMGS5060
DVTOL = 20.	CMGS5070
MAXNIT = 5	CMGS5080
CMULT = 1.1	CMGS5090
NRAMP = 3	CMGS5100
WARD(61) = 10.	CMGS5110
PHI=WARD(7)	CMGS5120
THETA = EX(2)	CMGS5130
ZXNB = 2.	CMGS5140
ZPOPT = 0.	CMGS5150
ZWSKIN = 1.	CMGS5160
FPEXT = 0.	CMGS5170
C SFR TRAJ PARAM INTO STORAGE - PRESTORED VALUES	CMGS5180
NTRAJ = 1	CMGS5190
DO 1969 ITR = 1, 670	CMGS5200
1969 TRCON(ITR,1) = TRYSDM(ITR)	CMGS5210
DO 1968 ITR = 1, 102	CMGS5220
1968 TRMOR(ITR,1) = TRFIX(ITR)	CMGS5230
6001 CONTINUE	CMGS5240
C	CMGS5250
C	CMGS5260
IF (INPRIN .LE. 0) NLIX = 0	CMGS5270
9022 GO TO (3,3,3,4,5,6,7,8,9,10,11,10) ,Z2	CMGS5280
10 CONTINUE	CMGS5290
9021 NFLAG = NFLAG + 1	CMGS5300
E1 = 902.	CMGS5310
WRITE (N6,2005) E1,ZCODE	CMGS5320
GO TO 902	CMGS5330
C**READ INOUT PARAMETERS	CMGS5340
3 GO TO 902	CMGS5350
4 IF (Z3.GT.1) GO TO 42	CMGS5360
NLIX = NLIX + 4	CMGS5370
IF (NLIX .GT. 50) CALL PAGE	CMGS5380
NLINE = NLINE + 4	CMGS5390
READ (N5,NAM1)	CMGS5400
IF (INPRIN .LE. 0) GO TO 8113	CMGS5410
WRITE(N6,8117)	CMGS5420
8117 FORMAT(// 3X,9HNAM1 LIST // 5X,11HI/O CONTROL)	CMGS5430
WRITE(N6,8118) IAIR,INPRIN, (IPRP(I),I=1,3) , IPSM,IVP,	CMGS5440
1 ICOST, IPACK, KFILL2, NPAGE	CMGS5450
8118 FORMAT(5X8HIAIR =,15/ 5X8HINPRIN =, 15/	CMGS5460
1 5X8HIPRP =,315/ 5X8HIPSM =,15/ 5X8HIVP =,15/	CMGS5470
W 5X8HICOST = , 15/ 5X8HIPACK = ,15/ 5X8HKFILL2 = ,15/	CMGS5480
2 5X8HNPAGE = , 15 //)	CMGS5490
CALL PAGE	CMGS5500
8113 CONTINUE	CMGS5510
1919 CONTINUE	CMGS5520
GO TO 902	CMGS5530
42 IF (Z3.GT.2) GO TO 43	CMGS5540
CALL PAGE	CMGS5550

READ (N5,NAM2)	CMGS5560
IF (INPRIN .GT. 0) WRITE (N6, NAM2)	CMGS5570
GO TO 900	CMGS5580
43 IF(73 .GT. 5) GO TO 44	CMGS5590
READ (N5, NAMBYP)	CMGS5600
IF (INPRIN .EQ. 0) GO TO 3944	CMGS5610
WRITE(N6,8142)	CMGS5620
8142 FORMAT(//5X,11HNAMBYP LIST//5X,28HINCLUDES NAMAR THROUGH NAMAG)	CMGS5630
WRITE(N6,8021)	CMGS5640
8021 FORMAT(//5X,29HNAMAR PRINTED IF YISP(1) NE 0 //	CMGS5650
1 5X,41HNAMAC AND NAMAD PRINTED IF SMACH1(2) NE 0 ///)	CMGS5660
WRITE(N6,8022) ACA3,KBYDRG,CDDDES,ASA3,KBYPAK,CLADES	CMGS5670
8022 FORMAT(10X4HACA3,F11.4, 5X6HKBYDRG,I9, 5X6HCDDDES,F9.3 //	CMGS5680
1 10X4HASA3,F11.4, 5X6HKBYPAK,I9, 5X6HCLADES,F9.3 /)	CMGS5690
WRITE(N6,8023) A6A3,KBYPSM,BEXIT,KBYVP	CMGS5700
8023 FORMAT(10X4HA6A3,F11.4, 5X6HKBYPSM,I9 //	CMGS5710
1 10X5HBEXIT,F10.2, 5X5HKBYVP,I10 /)	CMGS5720
WRITE(N6,8024) BISPVP,BDDWP,BTHVAC,DROPER,DROPST,SEXIT,SUSWP	CMGS5730
1 , XCGD1	CMGS5740
8024 FORMAT(10X5HBISPVP,F10.2// 10X5HBDDWP,F10.2 //10X6HBTHVAC,F9.0//	CMGS5750
1 10X6HDROPER,F9.2 // 10X6HDROPST,F9.2 // 10X5HSEXIT,F10.2	CMGS5760
2 // 10X5HSUSWP,F10.2 // 10X5HXCGD1,F10.2 /)	CMGS5770
WRITE(N6,8025) XLBDY, XNOZ	CMGS5780
8025 FORMAT(10X5HXLBDY,F10.2 // 10X4HXNOZ,F11.2 /)	CMGS5790
WRITE(N6,7948) KBYCST	CMGS5800
7948 FORMAT(30X, 6HKBYCST, I9 /)	CMGS5810
IF (YISP(1) .NE. 0.0) WRITE(N6,NAMAB)	CMGS5820
IF(SMACH1(2) .NE. 0.0) WRITE(N6,NAMAC)	CMGS5830
IF(SMACH1(2) .NE. 0.0) WRITE(N6,NAMAD)	CMGS5840
3944 CONTINUE	CMGS5850
KPY2(1)=KBYPSM	CMGS5860
KPY2(2)=KBYDRG	CMGS5870
GO TO 900	CMGS5880
44 IF(73 .GT. 7) GO TO 45	CMGS5890
GO TO 902	CMGS5900
45 IF(73 .GT. 8) GO TO 46	CMGS5910
C INPUT FOR AERODYNAMICS	CMGS5920
NLIX = NLIX + 8	CMGS5930
IF (NLIX .GT. 50) CALL PAGE	CMGS5940
NLINE = NLINE + 8	CMGS5950
READ (N5, NAMCNF)	CMGS5960
IF(INPRIN.LE.0) GO TO 8593	CMGS5970
WRITE(N6,8531)	CMGS5980
8531 FORMAT(/// 20X,31HCONFIGURATION OPTIONS DATA LIST //	CMGS5990
1 29X,15HNAMCNF NAMELIST //// 14X8HAIIRFRAME, 15X4HWING,	CMGS6000
2 16X4HTAIL,10X13HVERTICAL TAIL //	CMGS6010
WRITE(N6,8532) FACTOR,FSOVCW,FSOVCT,ARVT,ILUG,GULT,GULT,FSOVVT	CMGS6020
8532 FORMAT(10X6HFACTOR,F9.2, 5X6HFSOVCW,F9.2, 5X6HFSOVCT,F9.2,	CMGS6030
1 5X4HARVT,F11.4 // 10X4HILUG,I11, 5X4HGULT,F11.2,	CMGS6040
2 5X4HGULT,F11.2, 5X6HFSOVVT,F9.2 /)	CMGS6050
WRITE(N6,8533) THETAC,IPLANW,IPLANT,PANWVT,WCVAST,IWTS,IWTS,RXINVT	CMGS6060
8533 FORMAT(10X6HTHETAC,F9.4, 5X6HIPLANW,I9, 5X6HIPLANT,I9,	CMGS6070
1 5X6HPANWVT,F9.2 // 10X6HWCVAST,F9.2, 5X4HIWTS,I11,	CMGS6080
2 5X4HIWTS,I11, 5X6HRXINVT,F9.2 /)	CMGS6090
WRITE(N6,8534) ZPOPT,RL5,PANWHT,SLEVT,ZSKINI,RMDES,PANWT,STEVT	CMGS6100

8534	FORMAT(10X5HPZPOPT,F10.0, 5X3HRL5,F12.2, 5X6HPANWHT,F9.2,	CMGS6110
1	5X5HSLEVT,F10.2 // 10X6HZSKINI,F9.2, 5X5HRMDES,F10.2,	CMGS6120
2	5X5HPANWT,F10.2, 5X5HSTEVT,F10.2 /)	CMGS6130
	WRITE(N6,8535) ZWSKIN,	CMGS6140
1	RXINW,RXINT,TRAVT,SLEW,SLET,TRVT	CMGS6150
8535	FORMAT(10X6HZWSKIN,F9.2, 5X,	CMGS6160
A	5HRXINW,F10.2, 5X5HRXINT,F10.2, 5X5HTRAVT,F10.4 //	CMGS6170
1	30X4PSLEW,F11.2, 5X4HSLET,F11.2, 5X4HTRVT,F11.4 /)	CMGS6180
	WRITE(N6,8536) STEW,STET,VTALOC,TRAW,TRAT,WQVAVT	CMGS6190
8536	FORMAT(30X4HSTEW,F11.2, 5X4HSTET,F11.2, 5X6HVTALOC,F9.2 //	CMGS6200
1	30X4HTRAW,F11.4, 5X4HTRAT,F11.4, 5X6HWOVAVT,F9.2 /)	CMGS6210
	WRITE(N6,8537) TRW,TRT,WQVAW,WQVAHT,WWINGI,WQVAT,WTI	CMGS6220
8537	FORMAT(30X3HTRW,F12.4, 5X3HTRT,F12.4 // 30X5HWOVAW,F10.2,	CMGS6230
1	5X6HWOVAHT,F9.2 // 30X6HWWINGI,F9.2, 5X5HWOVAT,F10.2 //	CMGS6240
2	50X3HWTI,F12.2 //)	CMGS6250
	WRITE(N6,8548)	CMGS6260
8548	FORMAT(7X,52HALTITUDES AND MACH NO. USED IN COMPUTING AERO TABLES	CMGS6270
1)	CMGS6280
	WRITE(N6,8538) NALT,(ALTV(I),I=1,NALT)	CMGS6290
8538	FORMAT(10X4HNALT,I5/ 10X4HALTV,5X,5F10.0/ 19X5F10.0)	CMGS6300
	WRITE(N6,8539) NRM,(RMV(I),I=1,NRM)	CMGS6310
8539	FORMAT(10X3HNRM,I6/ 10X3HRMV6X,10F6.2/ 19X10F6.2)	CMGS6320
	CALL PAGE	CMGS6330
8593	CONTINUE	CMGS6340
	GO TO 902	CMGS6350
46	IF (Z3 .GT. 9) GO TO 902	CMGS6360
	NLIX = NLIX + 8	CMGS6370
	IF (NLIX .GT. 50) CALL PAGE	CMGS6380
	NLINE = NLINE + 8	CMGS6390
	READ (N5, NAMPK)	CMGS6400
	IF (INPRIN .GT. 0) WRITE (N6, NAMPK)	CMGS6410
	GO TO 900	CMGS6420
5	IF (Z3.GT.7) GO TO 58	CMGS6430
C	CALL PROTC	CMGS6440
	GO TO 900	CMGS6450
58	IF (Z3 .GT. 8) GO TO 59	CMGS6460
	NLIX = NLIX + 10	CMGS6470
	IF (NLIX .GT. 50) CALL PAGE	CMGS6480
	NLINE = NLINE + 10	CMGS6490
	IF (Z4 .GT. 0) GO TO 581	CMGS6500
	READ (N5, NAMBOC)	CMGS6510
	IF (INPRIN .LE. 0) GO TO 8693	CMGS6520
	WRITE(N6,8621)	CMGS6530
8621	FORMAT(//// 35X,40HBOOSTER DATA LIST (INTEGRAL OR EXTERNAL)	CMGS6540
1	// 46X,15HNAMBOC NAMELIST ////)	CMGS6550
	WRITE(N6,8622) ARM,EPI,GAM,RMCW,RNTM,AER,ETAX,GMAX,RMFSW,RNTWM	CMGS6560
8622	FORMAT(10X3HARM,F12.4, 5X3HEPI,F12.4, 5X3HGAM,F12.4,	CMGS6570
1	5X4HRMCW,F11.2, 5X4HRNTM,F11.4 // 10X3HAER,F12.4,	CMGS6580
2	5X4PETAX,F11.4, 5X4HGMAX,F11.2, 5X5HRMFSW,F10.2,	CMGS6590
3	5X5HPNTWM,F10.4 /)	CMGS6600
	WRITE(N6,8623) AFAT,FRM,PA,RMFW,SAW,AIT,FCWM,PBELL,RMIW,SEM	CMGS6610
8623	FORMAT(10X4HAFAT,F11.4, 5X3HFBM,F12.4, 5X2HFA,F13.2,	CMGS6620
1	5X4HRMFW,F11.2, 5X3HSAW,F12.4 // 10X3HAIT,F12.4,	CMGS6630
2	5X4HFCWM,F11.4, 5X5HPBELL,F10.2, 5X4HRMIW,F11.4,	CMGS6640
3	5X3HSEM,E12.2 /)	CMGS6650

WRITE(N6,8624) ASL,FER,PC,RNBWM,TCASEF,ASM,FIT,PCM,RNEC,TL	CMGS6660
8624 FORMAT(10X3FASL,F12.4, 5X3HFER,F12.4, 5X2HPC,F13.0,	CMGS6670
1 5X5HPNBWM,E10.3, 5X6HTCASEF,F9.4 // 10X3HASM,F12.4,	CMGS6680
2 5X3HFIT,F12.4, 5X3HPCM,F12.0, 5X4HRNEC,E11.3,	CMGS6690
3 5X2HTL,F13.4 /)	CMGS6700
WRITE(N6,8625) ASWM,FJ,PHI,RNECC,TMIN,CASEM,FMPAH,PSUP,RNEC1,TTH	CMGS6710
8625 FORMAT(10X4HASWM,F11.4, 5X2HFJ,F13.4, 5X3HPHI,F12.2,	CMGS6720
1 5X5HRNECC,E10.4, 5X4HTMIN,F11.4 // 10X5HCASEM,F10.4,	CMGS6730
2 5X5HFMPAH,F10.4, 5X4HPSUB,F11.2, 5X5HRNEC1,F10.2,	CMGS6740
3 5X3FTTH,F12.4 /)	CMGS6750
WRITE(N6,8626) CSTAR,FSL,RBOSS,RNEC2,VRFH, DENI,FSULX,RHOP,RNEC3	CMGS6760
8626 FORMAT(10X5HCSTAR,F10.2, 5X3HFSL,F12.4, 5X5HRBOSS,F10.4,	CMGS6770
1 5X5HRNEC2,F10.2, 5X4HVRFH,F11.4 // 10X4HDFNI,F11.4,	CMGS6780
2 5X5HFSULX,F10.4, 5X4HRHOP,F11.4, 5X5HRNEC3,F10.2 /)	CMGS6790
WRITE(N6,8627) DLFS,FSWM, RMASW, RNMW,EAR, FSYLX,RMAW, RNRM	CMGS6800
8627 FORMAT(10X4PDLFS,F11.4, 5X4HFSWM,F11.4, 5X5HRMASW,F10.4,	CMGS6810
1 5X4HPNMW,F11.2 // 10X3HEAR,F12.4, 5X5HFSYLX,F10.4,	CMGS6820
2 5X4HRMAW,F11.4, 5X4HRNRM,F11.2 /)	CMGS6830
CALL PAGE	CMGS6840
8653 CONTINUE	CMGS6850
GO TO 902	CMGS6860
581 CONTINUE	CMGS6870
READ (N5, NAMEXB)	CMGS6880
IF(INPRIN.LE.0) GO TO 8293	CMGS6890
WRITE(N6,8221)	CMGS6900
8221 FORMAT(/// 20X,26HEXTERNAL BOOSTER DATA LIST //	CMGS6910
1 25X,15HNAMEXB NAMELIST ///	CMGS6920
WRITE(N6,8222) C1,CLEAR,RHOTHT,TINAFI, C2,EL,RHOX,TINS	CMGS6930
8222 FORMAT(10X2HC1,F13.2, 5X5HCLEAR,F10.2, 5X6HRHOTHT,F9.4,	CMGS6940
1 5X6HTINAFI,F9.2 // 10X2HC2,F13.2, 5X2HEL,F13.2,	CMGS6950
2 5X4HRHOX,F11.4, 5X4HTINS,F11.2 /)	CMGS6960
WRITE(N6,8223) C3,MTLRAM,TEMPC,TMINC, C4,RHOENT,TENT,TMIND	CMGS6970
8223 FORMAT(10X2HC3,F13.2, 5X6HMTLRAM,I9, 5X5HTEMPC,F10.0,	CMGS6980
1 5X5HTMINC,F10.2 // 10X2HC4,F13.2, 5X6HRHOENT,F9.4,	CMGS6990
2 5X4TENT,F11.2, 5X5HTMIND,F10.2 /)	CMGS7000
WRITE(N6,8224) C5,RHOEXT,TEXTI,TTHROT,C6,RHOIN,TEXTER,	CMGS7010
1 WHARNS,THETA,XSTAR	CMGS7020
8224 FORMAT(10X2HC5,F13.2, 5X6HRHOEXT,F9.4, 5X5HTEXTI,F10.2,	CMGS7030
1 5X6HTTHROT,F9.2 // 10X2HC6,F13.2, 5X5HRHCIN,F10.4,	CMGS7040
2 5X6HTEXTER,F9.2, 5X6HWHARNS,F9.2 //	CMGS7050
3 5X5HTHETA,F10.2, 5X5HXSTAR,F10.2 /)	CMGS7060
CALL PAGE	CMGS7070
8253 CONTINUE	CMGS7080
GO TO 902	CMGS7090
59 IF (Z3 .GT. 11) GO TO 159	CMGS7100
NLIX = NLIX + 6	CMGS7110
IF (NLIX .GT. 50) CALL PAGE	CMGS7120
READ (N5, NAMSR)	CMGS7130
IF(INPRIN.LE.0) GO TO 8353	CMGS7140
WRITE(N6,8321)	CMGS7150
8321 FORMAT(///// 20X,32HSOLID ROCKET SUSTAINER DATA LIST //	CMGS7160
1 29X,14HNAMSR NAMELIST ///	CMGS7170
WRITE(N6,8322) AIAT, PHINOZ, RHOS, APAT, REAH, SIGMTL	CMGS7180
8322 FORMAT(10X4HAIAT,F11.4, 5X6HPHINOZ,F9.2, 5X4HRHOS,F11.4 //	CMGS7190
1 10X4HAPAT,F11.4, 5X4HREAH,F11.2, 5X6HSIGMTL,F9.0 /)	CMGS7200

WRITE(N6,8323) ETACF,REFH,TIC,EXPRR,RHOISS,TRATIC,	CMGS7210
1 PRELS,RHOMTL,WMSOL	CMGS7220
8323 FORMAT(10X5HETACF,F10.4, 5X4HREFH,F11.2, 5X3HTIC,F12.2 //	CMGS7230
1 10X5HEXPRR,F10.4, 5X6HRHOISS,F9.4, 5X6HTRATIO,F9.2 //	CMGS7240
2 10X5HPRELS,F10.2, 5X6HRHOMTL,F9.4, 5X5HWSOL,F10.2 /)	CMGS7250
WRITE(N6,7927) ETSISP,CSTAR1,CSTAR2	CMGS7260
7927 FORMAT(10X6HETSISP,F9.4 // 10X6HCSTAR1, F9.2 //	CMGS7270
1 10X6HCSTAR2, F9.2 /)	CMGS7280
CALL PAGE	CMGS7290
8393 CONTINUE	CMGS7300
NLINE = NLINE + 6	CMGS7310
PHINOR = PHINOZ / RAD	CMGS7320
GO TO 902	CMGS7330
159 IF (Z3 .GT. 12) GO TO 1159	CMGS7340
NLIX = NLIX + 6	CMGS7350
IF (NLIX .GT. 50) CALL PAGE	CMGS7360
NLINE = NLINE + 6	CMGS7370
READ(N5,NAMLR)	CMGS7380
IF(INPRIN.LE.0) GO TO 8493	CMGS7390
WRITE(N6,8421)	CMGS7400
8421 FORMAT(/// 30X,33HLIQUID ROCKET SUSTAINER DATA LIST //	CMGS7410
1 39X,14HNAMLR NAMELIST ////)	CMGS7420
WRITE(N6,8422) DBT,P1,PBELL,TERAC, ETACL,P2,PSTAR,TRATIL	CMGS7430
8422 FORMAT(10X3HDBT,F12.4, 5X2HP1,F13.2, 5X6HPRELL,F9.2,	CMGS7440
1 5X5HTERAC,F10.4 // 10X5HETACL,F10.4, 5X2HP2,F13.4,	CMGS7450
2 5X5HPSTAR,F10.2, 5X6HTRATIL,F9.4 /)	CMGS7460
WRITE(N6,8423) ETATSP,P3,PT, EXS1,P4,PVOX,WMI SCL	CMGS7470
8423 FORMAT(10X6HETATSP,F9.4, 5X2HP3,F13.4, 5X2HPT,F13.2,	CMGS7480
1 // 10X4HEXS1,F11.4, 5X2HP4,F13.6,	CMGS7490
2 5X4HPVOX,F11.2, 5X6HWMISCL,F9.2 /)	CMGS7500
WRITE(N6,8424) ITANK,P5,REFH,WOVAC1,ITWANK,P6,RHOF,WCVAC2	CMGS7510
8424 FORMAT(10X5HITANK,I10, 5X2HP5,F13.6, 5X3HREFH,F12.2,	CMGS7520
1 5X6HWOVAC1,F9.4 // 10X6HIWANK,I9, 5X2HP6,F13.6,	CMGS7530
2 5X4HRHOF,F11.2, 5X6HWOVAC2,F9.4 /)	CMGS7540
WRITE(N6,8425) METAL,P7,RHOOX,WOVAN1, P8,SAFAC,WOVAN2,TCWI,XOLMIS	CMGS7550
8425 FORMAT(10X5HMETAL,I10, 5X2HP7,F13.6, 5X5HRHOOX,F10.2,	CMGS7560
1 5X6HWOVAN1,F9.4 // 30X2HP8,F13.6, 5X5HSAFAC,F10.2,	CMGS7570
2 5X6HWOVAN2,F9.4 // 50X4HTCWI,F11.4, 5X6HXOLMIS,F9.2 /)	CMGS7580
CALL PAGE	CMGS7590
8493 CONTINUE	CMGS7600
1159 GO TO 902	CMGS7610
6 CONTINUE	CMGS7620
IF (Z3 .GT. 10) GO TO 160	CMGS7630
C INPUT FOR PROPUSSION SIZING	CMGS7640
IF (Z3 .GT. 1) GO TO 62	CMGS7650
NLIX = NLIX + 15	CMGS7660
IF (NLIX .GT. 50) CALL PAGE	CMGS7670
NLINE = NLINE + 15	CMGS7680
READ (N5, NAMRJS)	CMGS7690
IF (INPRIN .LE. 0) GO TO 8793	CMGS7700
WRITE (N6,8721)	CMGS7710
8721 FORMAT(///// 28X,26HRAJET SUSTAINER DATA LIST //	CMGS7720
1 34X,15HNAMRJS NAMELIST ///)	CMGS7730
WRITE(N6,8722) A6MAX,EXIN,PKD, TBLAD,A6MIN,FSLBO,PN2,TCASEC	CMGS7740
8722 FORMAT(10X5HA6MAX,F10.4, 5X4HEXIN,F11.3, 5X3HPKD,F12.2,	CMGS7750

1	5X5HTBLAD,F10.3// 10X5HA6MIN,F10.4, 5X5HFSLB0,F10.3,	CMGS7760
2	5X3HPN2,F12.0, 5X6HTCASEC, F9.3 /)	CMGS7770
	WRITE(N6,8723) ACMAX,FTUS,PT41,TFUEL,AL,FTYS,PT42,THGG	CMGS7780
8723	FORMAT(10X5HACMAX,F10.4, 5X4HFTUS,F11.3, 5X4HPT41,F11.0,	CMGS7790
1	5X5HTFUEL,F10.2 // 10X2HAL,F13.4, 5X4HFTYS,F11.3,	CMGS7800
2	5X4HPT42,F11.0, 5X4HTHGG,F11.2 /)	CMGS7810
	WRITE(N6,8724) ANN,GMF,PT43,TMAX, CDB,IFTYPE,RGD,TSUS	CMGS7820
8724	FORMAT(10X3HANN,F12.4, 5X3HGMF,F12.3, 5X4HPT43,F11.0,	CMGS7830
1	5X4HTMAX,F11.2 // 10X3HCDB,F12.2, 5X6HIFTYPE,I9,	CMGS7840
2	5X3HRGD,F12.2, 5X4HTSUS,F11.2 /)	CMGS7850
	WRITE(N6,8725) CLX,KFM, RHOINS,ULLG, CNM,MATPB,RHCRJF,VPP	CMGS7860
8725	FORMAT(10X3HCLX,F12.2,5X3HKFM,I12, 5X6HRHOINS,F9.3,	CMGS7870
1	5X4HULLG,F11.4 // 10X3HCNM,F12.4, 5X5HMATPB,I10,	CMGS7880
2	5X6HRHORJF,F9.3, 5X3HVPP,F12.4 /)	CMGS7890
	WRITE(N6,8726) DELT4,MATTK,ROB,X1, DROF,NR,RU,X2	CMGS7900
8726	FORMAT(10X5HDELT4,F10.0, 5X5HMATTK,I10, 5X3HROB,F12.3,	CMGS7910
1	5X2HX1,F13.4 // 10X4HDROF,F11.2, 5X2HNB,I13,	CMGS7920
2	5X2HRU,F13.3, 5X2HX2,F13.4 /)	CMGS7930
	WRITE(N6,8727) EDR, SPPWF,XMOMR, EEXP,PDF	CMGS7940
8727	FORMAT(10X3PEDR,F12.2, 20X, 5X5HSPPWF,F10.3,	CMGS7950
1	5X5HXMOMR,F10.4 // 10X4HEEXP,F11.2, 5X3HPDF,F12.3)	CMGS7960
	CALL PAGE	CMGS7970
8753	CONTINUE	CMGS7980
	GO TO 902	CMGS7990
62	IF (Z3 .GT. 2) GO TO 63	CMGS8000
	NLIX = NLIX + 15	CMGS8010
	IF (NLIX .GT. 50) CALL PAGE	CMGS8020
	NLINE = NLINE + 15	CMGS8030
	GO TO 902	CMGS8040
63	IF (Z3 .GT. 3) GO TO 64	CMGS8050
	GO TO 902	CMGS8060
64	IF (Z3 .GT. 4) GO TO 65	CMGS8070
	GO TO 902	CMGS8080
65	IF (Z3 .GT. 5) GO TO 66	CMGS8090
	NLIX = NLIX + 10	CMGS8100
	IF (NLIX .GT. 50) CALL PAGE	CMGS8110
	NLINE = NLINE + 10	CMGS8120
	GO TO 902	CMGS8130
66	IF (Z3 .GT. 6) GO TO 68	CMGS8140
	KRJE = 1	CMGS8150
	CALL RJINPT (Z4, NRAMP, INPRIN, Z5)	CMGS8160
	GO TO 902	CMGS8170
160	IF (Z3 .GT. 20) GO TO 260	CMGS8180
	IF (Z3 .GT. 15) GO TO 167	CMGS8190
C	INPUT FOR VEHICLE PERFORMANCE	CMGS8200
	READ (N5, NAMVPM)	CMGS8210
	IF (INPRIN .LE. 0) GO TO 8450	CMGS8220
	WRITE(N6,8415)	CMGS8230
8415	FORMAT(// 5X,29HTRAJECTORY PHASE CONTROL LIST //)	CMGS8240
	WRITE(N6,8413) NCPHAZ, ALTI, FARMAX, NDPHAZ, GAMMAI,	CMGS8250
1	TPCMGN, TT4MAX	CMGS8260
8413	FORMAT(// 3X6HNCPHAZ,I7, 3X4HALTI,F10.0, 3X6HFARMAX,F9.4 //	CMGS8270
1	3X6HNDPHAZ,I7, 3X6HGAMMAI,F8.4,	CMGS8280
2	3X6HTPCMGN, F9.3 // 36X6HTT4MAX, F9.0 /)	CMGS8290
	WRITE(N6,8314) NLPHAZ, MOPT, NZLLRI, VELI, XMACHI	CMGS8300


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8314 FORMAT( 3X6HNLP HAZ,I7, 3X4HMOPT,I10 // 3X6HNZLLRI,I7,
1      3X4HVELI,F10.2 // 19X6HXMACHI , F8.2 )
WRITE(N6,8437)
8437 FORMAT( // )
WRITE(N6,8417)
8417 FORMAT(5X3HNO.,2X6HALP MAX,6X4HALTF, 1X6HANZMAX, 5X6HFVALUE,
1      1X6HGAMMAF, 1X5HICONT, 1X6HIPTYPE, 1X5HITERM, 1X5HMHGEN,
2      1X5HMODES, 1X5HNAERO, 1X6HXMACHF, 1X6HZPRINT,
3      2X6HTPHASE, 2X6HTTOTAL, 1X5HSLOPE / )
DO 8475 NP = 1, 20
IF ( ICONT(NP) .LE. 0 ) GO TO 8430
WRITE(N6,8427) NP,ALP MAX(NP), ALTF(NP),ANZ MAX(NP),FVALUE(NP),
1      GAMMAF(NP), ICONT(NP), IPTYPE(NP), ITERM(NP), MHGEN(NP),
2      MODES(NP), NAERO(NP), XMACHF(NP), ZPRINT(NP)
3      , TPHASE(NP), TTOTAL(NP), SLOPE(NP)
8475 CONTINUE
8427 FORMAT(5X, I3, 2X, F6.1, F10.0, F7.1, F11.2, F7.2, I6, I7, 4I6, F7.2, F7.1,
1      F8.1, F8.1, F6.0 )
8430 CONTINUE
WRITE(N6,8431)
8431 FORMAT(// 5X,39HDALPH DALT DCFN DELMAX DHCL DMACH ,
1      43HDMIN DSTART DVCL EREF ERRFAC GK GKV ,
2      30HGKVC RU GTOPT RANGEI RTOL TIMEI )
WRITE(N6,8432) DALPH,DALT,DCFN,DELMAX,DHCL,DMACH,DMIN,DSTART,
1      DVCL,EREF,ERRFAC,GKG,GKV,GKVC RU,GTOPT,RANGEI,RTOL,TIMEI
8432 FORMAT( 5X,F5.3, F7.0, F5.2, F7.1, F7.0, F6.2, F6.4, F7.3, F6.0,
1      F8.6, F7.1, F4.1, F6.4, F7.1, F6.1, F7.1, F5.1, F6.1 )
C
8433 FORMAT(// 5X,6HIPROP1, 1X6HJPRINT, 1X6HMXSTEP, 1X5HNTRY S )
8434 FORMAT(5X, I6, 2I7, I6 )
WRITE(N6,8437)
DO 8440 NP=1,20
ICTS = ICONT(NP)
IF ( (ICTS.LE.0) .OR. (ICTS.GT.12) ) GO TO 8440
NPI = 10 * NP - 9
NPD = NPI + 200
NPIL = 10 * NP
NPDL = NPIL + 200
WRITE(N6,8442) NP,(CONDZ(I),I=NPI,NPIL),
1      NP,(CONDZ(I),I=NPD,NPDL)
8442 FORMAT ( 5X4HCONI,I2, 10F10.2/ 5X4HCOND,I2, 10F10.2 /)
8440 CONTINUE
8450 CONTINUE
IF ( Z5 .LT. 1 ) Z5 = 1
IF ( Z5 .GT. 5 ) GO TO 8409
NTRAJ = MAXC ( NTRAJ, Z5 )
SER TRAJ PARAM INTO STORAGE - INPUT VALUES
DO 8407 ITR = 1, 670
8407 TRCON(ITR,Z5) = TRYSON(ITR)
DO 1979 ITR=1,102
1979 TRMOR(ITR,Z5) = TRFIX(ITR)
8409 CONTINUE
C
RESET TRAJ PARAM FOR FIRST TRAJ
DO 1976 ITR = 1, 102
1976 TRFIX(ITR) = TRMOR(ITR,1)

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DO 1975 ITR = 1, 670	CMGS8860
1975 TPYSOM(ITR) = TRCON(ITR, 1)	CMGS8870
GO TO 900	CMGS8880
167 IF (Z3 .GT. 17) GO TO 168	CMGS8890
GO TO 902	CMGS8900
168 IF (Z3 .GT. 18) GO TO 902	CMGS8910
GO TO 900	CMGS8920
260 CONTINUE	CMGS8930
GO TO 902	CMGS8940
68 IF (Z3 .GT. 8) GO TO 902	CMGS8950
READ (N5, NAMTJ)	CMGS8960
ALFTX = ALFTJ	CMGS8970
IF (INPRIN .GT. 0) WRITE (N6, NAMTJ)	CMGS8980
GO TO 900	CMGS8990
C	CMGS9000
C**CO READ BASIC TABLES	CMGS9010
7 IX = Z4	CMGS9020
IF (Z3.GE.2) GO TO 72	CMGS9030
C** READ BASIC TABLES AND STORE ON DA DISK 11	CMGS9040
CALL TRASIC(IX)	CMGS9050
GO TO 902	CMGS9060
72 IF(IPR(1).EQ.0) WRITE(6, 2002) ZCODE	CMGS9070
IF(Z3.GT.2) GO TO 73	CMGS9080
IF(Z4.GT.1) GO TO 722	CMGS9090
C**** TRANSFER DISK 11 TO TAPE 2.	CMGS9100
CALL TF1102	CMGS9110
GO TO 902	CMGS9120
C**** TRANSFER TAPE 2 TO DISK 11.	CMGS9130
722 CALL TF0211	CMGS9140
GO TO 902	CMGS9150
C**** DELETE ALL TEMPORARY TABLES ON DISK 11	CMGS9160
73 IF (Z3.GT.3) GO TO 74	CMGS9170
K = 0	CMGS9180
DO 7301 I=1, NB11	CMGS9190
IF (INDX11(I, 7).GE.0) GO TO 7301	CMGS9200
K = K + 1	CMGS9210
INDX11(I, 2) = 0	CMGS9220
7301 CONTINUE	CMGS9230
NB11 = NB11 - K	CMGS9240
IF (K.GT.0) ND11=INDX11(NB11+1, 4)	CMGS9250
GO TO 902	CMGS9260
74 CALL TRASIC(IX)	CMGS9270
KBASVA = 1	CMGS9280
GO TO 902	CMGS9290
8 CONTINUE	CMGS9300
CALL INCOST(Z3, INPRIN)	CMGS9310
GO TO 900	CMGS9320
C** SETUP SEM WORTH AND DERIVATIVES	CMGS9330
9 IF (Z3.GT.1) GO TO 92	CMGS9340
CALL PAGE	CMGS9350
READ (N5, NAM2)	CMGS9360
WRITE (N6, NAM2)	CMGS9370
NLINE = NLINE + 4	CMGS9380
IP = IPR(4)	CMGS9390
C CALL NEMWTH	CMGS9400

WRITE (N6,NAM4)	CMGS9410
NLINE = NLINE + 4	CMGS9420
GO TO 902	CMGS9430
C** PUNCH CARDS FOR WORTH AND DERIVATIVES	CMGS9440
92 IF (Z3.GT.2) GO TO 93	CMGS9450
WRITE (N6,NAM3)	CMGS9460
WRITE (N7, NAM3)	CMGS9470
GO TO 900	CMGS9480
C** READ WORTH AND DERIVATIVES DIRECTLY	CMGS9490
93 IF (Z3.GT.3) GO TO 94	CMGS9500
IF (NLINE.GT.50) CALL PAGE	CMGS9510
READ (N5,NAM3)	CMGS9520
IF (INPRIN .GT. 0) WRITE (N6, NAM3)	CMGS9530
NLINE = NLINE + 8	CMGS9540
GO TO 900	CMGS9550
94 GO TO 902	CMGS9560
C	CMGS9570
CXX SYNTHESIZE COMPATIBLE CONFIGURATIONS	CMGS9580
11 IF (Z3.GT.1) GO TO 112	CMGS9590
IF (Z4 .GE. 2) GO TO 111	CMGS9600
IF (KPAVA .LE.0) GO TO 111	CMGS9610
C**READ AND WRITE SETUPS	CMGS9620
C**** COMPATIBILITY MATRICES REQ IF Z4 = 0	CMGS9630
IX = 74	CMGS9640
CALL SETUP1 (IX, Z5, KASE, IXX, Z4)	CMGS9650
IF (IXX.NE.0) NFLAG=NFLAG + 1	CMGS9660
IF (Z4 .GT. 0) GO TO 110	CMGS9670
CALL WPT1(2)	CMGS9680
CALL PAGE	CMGS9690
110 CONTINUE	CMGS9700
IX = 1	CMGS9710
CALL SETUP3(IX,Z5,Z6,IPR(5),NLINE,NPAGE,PCODE,IXX)	CMGS9720
KPAVA = 0	CMGS9730
IF (IXX.NE.0) NFLAG2 = NFLAG2 + 1	CMGS9740
111 CONTINUE	CMGS9750
IX = 2	CMGS9760
C READ SUPERVISORY NAMELIST WHICH OVERRIDES MISC LISTS	CMGS9770
READ (N5,SUPER)	CMGS9780
IF (ZXNB .LE. 0.) ZXNB = 1.	CMGS9790
IF (INPRIN .LE.0) GO TO 8893	CMGS9800
WRITE(N6,8821)	CMGS9810
8821 FORMAT(/// 30X,15HSUPER NAMELIST ///13X10HTRAJECTORY,	CMGS9820
1 10X10HPROPULSION, 10X13HCONFIGURATION / 13X10HDATA ITEMS,	CMGS9830
2 10X10HDATA ITEMS, 10X10HDATA ITEMS //)	CMGS9840
WRITE(N6,8822) ALTI,BCANTA,ART,FARMAX,DIAFR,BRAT	CMGS9850
8822 FORMAT(10X4HALTI,F12.0,4X6HBCANTA,F10.2, 4X3HART,F13.4 //	CMGS9860
1 10X6HFARMAX,F10.4, 4X5HDIAFR,F11.2, 4X4HBRAT,F12.4//)	CMGS9870
WRITE(N6,8823) GAMMAI, FINE, FRBT	CMGS9880
8823 FORMAT(10X6HGAMMAI,F10.2, 20X, 4X4HFINE,F12.4 //	CMGS9890
1 26X, 20X, 4X4HFRBT,F12.4 /)	CMGS9900
WRITE(N6,8824) MCPT, IART,NCPHAZ,DVMULT,IARW	CMGS9910
8824 FORMAT(10X4HMCPT,I12, 20X, 4X4HIART,I12 //	CMGS9920
1 10X6HNCPHAZ,I10, 4X6HDVMULT,F10.2, 4X4HIARW,I12 /)	CMGS9930
WRITE(N6,8825) NDPHAZ,DVTOL,IBTL,NLPHAZ,INWDR,ICNTRL	CMGS9940
8825 FORMAT(10X6HNDPHAZ,I10, 4X5HDVTOL,F11.2, 4X4HIBTL,I12 //	CMGS9950

1	10X6HNLPHAZ,I10, 4X6HINWQRL,I10, 4X6HICNTRL,I10 /)	CMGS*9960
	WRITE(N6,8826) NZLLRI,ITHR,ISURFT,TPCMGN,	CMGS*9970
1	TT4MAX,KINLET,ISURFW	CMGS*9980
8826	FORMAT(10X6PNZLLRI,I10, 4X4HITHR,I12, 4X6HISURFT,I10 //	CMGS*9990
A	10X6HTPCMG,N,F10.3 //	CMGS*000
1	10X6HTT4MAX,F10.0, 4X6HKINLET,I10,4X6HISURFW,I10//	CMGS*010
	WRITE(N6,8827) VELI,KPROP,ITN,XMACHI,MAXNIT,ITSECT	CMGS*020
8827	FORMAT(10X4HVELI,F12.2, 4X5HKPROP,I11, 4X3HITN,I13 //	CMGS*030
1	10X6HXMACHI,F10.2, 4X6HMAXNIT,I10, 4X6HITSECT,I10//	CMGS*040
	WRITE(N6,8828) IWSECT,NZTEMP,KINLET,VEOP,NW,VL,WMI SC,	CMGS*050
1	XLBDY, 7XNB	CMGS*060
8828	FORMAT(30X, 16X, 4X6HIWSECT,I10 //30X6HNZTEMP,I10,	CMGS*070
1	4X6HKINLET,I10 //30X4HVEOB,F12.2, 4X2HNW,I14 //	CMGS*080
2	30X2HVL,F14.2, 4X5HWMISC,F11.2 //	CMGS*090
3	30X5HXLBDY,F11.2 //	CMGS*100
4	30X4H7XNB,F12.0)	CMGS*110
	CALL PAGE	CMGS*120
8853	CONTINUE	CMGS*130
	IF (KLNCH .GT. 0) GO TO 1920	CMGS*140
1920	CONTINUE	CMGS*150
	DO 1925 I = 1, 10	CMGS*160
1925	TRCON(I,1) = TRYSCM(I)	CMGS*170
	INTYPE = KINLET	CMGS*180
	TRMOP(83,1) = TPCMG,N	CMGS*190
	ITNX = ITN	CMGS*200
	IARTX = IART	CMGS*210
	IAPWQ = IARW	CMGS*220
	IARWX = IARW	CMGS*230
	FRRTX=FRRT	CMGS*240
	NAERX(1)= ITN	CMGS*250
	NAERX(2)= IPTL	CMGS*260
	NAERX(3)= ILUG	CMGS*270
	NAERX(4)= NW	CMGS*280
	NAERX(5)= ICNTRL	CMGS*290
	NAERX(6)= IART	CMGS*300
	NAERX(7)= IARW	CMGS*310
	NAERX(10)= ITSECT	CMGS*320
	NAERX(11)= IWSECT	CMGS*330
	NAERX(16)= IPLOT	CMGS*340
	NAERX(30)= NCGVAR	CMGS*350
	NWX = NW	CMGS*360
	IWTPL = ZPDPT	CMGS*370
	WSINPU = ZWSKIN	CMGS*380
	HPXXX = HPXT	CMGS*390
	BPAZ = BPAT	CMGS*400
	XAZ2(2) = THETAC	CMGS*410
	KIND = KPROP	CMGS*420
	FX(1)=PHI*.0174533	CMGS*430
	FX(2) = THETA*.0174533	CMGS*440
	WARD(7) = PHI *.01745329	CMGS*450
	ZPNACC(1) = DPNACC	CMGS*460
	ZPTACC(1) = OPTACC	CMGS*470
	ZPERFU(1) = DPERFU	CMGS*480
	ITHI = ITHR	CMGS*490
	FACT = 2. * 7XNB	CMGS*500

C4 = C4 + WHARNS / FACT	CMGS*510
C5 = C5 + WHARNS / FACT	CMGS*520
FSULT = FSULX	CMGS*530
FSYLD = FSYLX	CMGS*540
ZCODES(1) = CCODES	CMGS*550
ZLADES(1) = CLADES	CMGS*560
NODP = 1	CMGS*570
JPJ = 1	CMGS*580
IFIRST = 1	CMGS*590
J = 1	CMGS*600
IF (WARD(5) .GT. 100.) J = 0	CMGS*610
NPASS = 0	CMGS*620
IFX = 0	CMGS*630
IF(KIND .EQ. 43 .OR. KIND .EQ. 44) IFX = 1	CMGS*640
IF(KIND .EQ. 44 .OR. KIND .EQ. 53) IBSTIN = 0	CMGS*650
CALL SUPRCM (IX)	CMGS*660
IF (KFIL12 .GT. 0) GO TO 900	CMGS*670
INTR = KSAVPL - KONPL	CMGS*680
IF (NCONFG .GE. INTR) NCONFG = INTR - 1	CMGS*690
JD12 = KSAVPL - 1	CMGS*700
WRITE(M12'JD12) NCONFG	CMGS*710
GO TO 900	CMGS*720
112 IF (Z3.GT.2) GO TO 113	CMGS*730
GO TO 900	CMGS*740
113 IF (Z3.GT.2) GO TO 114	CMGS*750
C MOD TO NAMELIST	CMGS*760
READ (N5, NAMSCR)	CMGS*770
IF (INPRIN .GT. 0) WRITE (N6, NAMSCR)	CMGS*780
Z4 = NLEVEL	CMGS*790
Z5 = LWF1	CMGS*800
Z6 = LWF2	CMGS*810
IF (KFIL12 .GT. 0) GO TO 115	CMGS*820
JD12 = KSAVPL - 1	CMGS*830
READ (M12'JD12) NCONFG	CMGS*840
IF (NCONFG .LE. 0) GO TO 115	CMGS*850
CALL SORTCM	CMGS*860
GO TO 900	CMGS*870
114 CONTINUE	CMGS*880
ICNO = 1	CMGS*890
CALL COST(ICNO)	CMGS*900
GO TO 900	CMGS*910
115 CONTINUE	CMGS*920
NCON = 0	CMGS*930
WRITE (N6,116)	CMGS*940
116 FORMAT(10X4CHNO CM CONCEPTS FOUND, SCREENING BYPASSED)	CMGS*950
JD12 = KSAVPL	CMGS*960
WRITE (M12'JD12) NCON	CMGS*970
900 KRET = 0	CMGS*980
IF (INPRIN .LE. 0) GO TO 902	CMGS*990
RETURN	CMGS*000
902 KRET = 2	CMGS*010
RETURN	CMGS*020
END	CMGS*030

SUBROUTINE SUPRCM (IX)	SUPR0010
C NUK,CM-CGSM P.K.MCDONOUGH FIV/EBCD 10/18/73	SUPR0020
C INITIALIZE AND LOOP ON BASIC VARIABLES	SUPR0030
C	SUPR0040
COMMON GENERAL	SUPR0050
COMMON /QACOST/ QMAXQ, VMAXQ, DUMQA(8)	SUPR0060
INTEGER*2 ICM	SUPR0070
COMMON /BASVAR/ LWOPT,TOTL,TOTWT,TOTDIA,PROPL,TCTAR,RATIO,	SUPR0080
1 WAREA,TARFA,ASPECT,PLCL,WHWT,GUIDWT,DUMZZZ(7)	SUPR0090
COMMON /RESYET/ ZXNR,PES14(14)	SUPR0100
COMMON /COMVLS/ COM(51)	SUPR0110
EQUIVALENCE (COM(14), AX),	SUPR0120
1 (COM(30),ZXNRX),	SUPR0130
2 (COM(31),D3X),	SUPR0140
3 (COM(39),WWHXXX),	SUPR0150
4 (COM(51),NCONFEX)	SUPR0160
COMMON/CON1/INX(16),NCONPT,NSSTYP,IL(30),NICOMA	SUPR0170
COMMON /CONLY/ KINDNS, DIAFRT, SCMMOR(8)	SUPR0180
COMMON /CONSTA/ FUNFOR(4), RAD, FUNTHR(3)	SUPR0190
COMMON /COSTSC/ CTOT,CPTOT,CRTOT,COMPC(17)	SUPR0200
COMMON/CSET3/KASE,LBVIX,LABVIX,MBVIX,MABVIX,NBV,NAUXV,IMBVIX(24)	SUPR0210
1, BAUXV(16,10),PTC(4,30)	SUPR0220
2, BVIX(24,16),NT(30),LABT,MABT,NABT,NBT,RT(10,10,30)	SUPR0230
3, ICM(16,16,10)	SUPR0240
COMMON /FUNQVR/ MODEL	SUPR0250
COMMON /GUIDCO/ COSN,NSCRC,WTGUID,DUM57(57)	SUPR0260
COMMON / INQUI / IPR(16), JPAR(16), PAR(16)	SUPR0270
COMMON / INQUI2 / JD12,ND12, NB12	SUPR0280
COMMON / INOUT / NLINE,	SUPR0290
X NPAGE,PCODE(20),MISC(7),XMISC(7),ZIP,ZCODE(19),	SUPR0300
1 JRASH(20), TRASH(20),IRB(8),ICB(8), DUM(8), IDUM(8), NFLAG,	SUPR0310
2 NFLAG2	SUPR0320
COMMON /NFILES/ N5,N6,N7,N11,N12,N1	SUPR0330
COMMON /PRINTR/ IPSM,KTIMES,IVP,IAIR,IPACK,ITOT,IALI	SUPR0340
COMMON /ROUNDP/ PENG(20), WORTZ, CEP, RANGE, RUF20(20)	SUPR0350
COMMON /S13/MINX(70),IP(70),IC(70),IS1(70),IS2(70)	SUPR0360
COMMON /SCRNNL/ NPTS(20),PARVNL(7,20),DWNL(7,20),DUMMY(50)	SUPR0370
1 ,NSCOST, IDU4M4(4)	SUPR0380
EQUIVALENCE (IDU4M4(1), KBYCST)	SUPR0390
COMMON /SOLMIS/ SOL9(9), WSECT	SUPR0400
COMMON / SWORTH/ KBASE, WORTH1, WORTH2, NPAR, KPAR(20), PARV(20),	SUPR0410
1 DERV1(20), DERV2(20)	SUPR0420
COMMON /SY1/MCODE(6),NCODES,NCONFG	SUPR0430
COMMON /SY2/TC,AC,FF	SUPR0440
COMMON /TEMP/JX1(70),JX2(70),JX3(70),JX4(70),RX1(70),RX2(70),	SUPR0450
1 PX3(70),RX4(70),JX(24)	SUPR0460
EQUIVALENCE	SUPR0470
1 (IL(1),IL1),(IL(2),IL2),(IL(3),IL3),(IL(4),IL4),(IL(5),IL5),(IL(6),	SUPR0480
2 IL6),(IL(7),IL7),(IL(8),IL8),(IL(9),IL9),(IL(10),IL10),(IL(11),	SUPR0490
3 IL11),(IL(12),IL12),(IL(13),IL13),(IL(14),IL14),(IL(15),IL15),(IL	SUPR0500
4 (16),IL16),(IL(17),IL17),(IL(18),IL18),(IL(19),IL19),(IL(20),IL20	SUPR0510
5),(IL(21),IL21),(IL(22),IL22),(IL(23),IL23),(IL(24),IL24),(IL(25)	SUPR0520
6 ,IL25),(IL(26),IL26),(IL(27),IL27),(IL(28),IL28),(IL(29),IL29),(I	SUPR0530
7 L(30),IL30)	SUPR0540
EQUIVALENCE	SUPR0550


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1 (JX(1),I1),(JX(2),I2),(JX(3),I3),(JX(4),I4),(JX(5),I5),(JX(6),I6)SUPR0560
2 ,(JX(7),I7),(JX(8),I8),(JX(9),I9),(JX(10),I10),(JX(11),I11),(JX(12),I12)SUPR0570
3 2),(JX(13),I13),(JX(14),I14),(JX(15),I15),(JX(16),I16),(JX(17),I17)SUPR0580
4 7),(JX(18),I18),(JX(19),I19),(JX(20),I20),(JX(21),I21),(JX(22),I22)SUPR0590
5 2),(JX(23),I23),(JX(24),I24)SUPR0600
COMMON /ZWORTH/ ZCEP(10), ZFORCE, ZGWT(10), ZREL, ZWOTH(10) SUPR0610
EQUIVALENCE ( ZWOTH(1), NZLLRI ) SUPR0620
EQUIVALENCE ( ZWOTH(9), WTH1 ), ( ZWOTH(10), WTH2 ) SUPR0630
COMMON PAYLOAD SUPR0640
COMMON /SEVEN/ ITN,XZ2(2),IRADAR,IPAY,XZ22(2),WEQ,WMISC,XZ7(7), SUPR0650
1 IART,NW,IARW,PIVOT,INTYPE,XLPAYI,WPAYI,WWH,XZ29(29) SUPR0660
COMMON ADM SUPR0670
COMMON /AERO/ ARZ14(14), CFB, ARZ91(91) SUPR0680
EQUIVALENCE ( ARZ91(43), XD1TP ) SUPR0690
COMMON /AERPRO/ CCODES(10), CLADES(10) SUPR0700
COMMON /AERZ/ CDO3(3), CDO, CDO37(37) SUPR0710
COMMON /BOAT/ CDLUMP,CDPBT,CDUM8(8),CDBOAT(10) SUPR0720
COMMON/OUTLNR/ XLNRVS(50) SUPR0730
EQUIVALENCE ( KLIMIT, XLNRVS(11) ) SUPR0740
COMMON /PYAIR/ SREFS, BVRNX(800) SUPR0750
COMMON /DRG/ DRG42(42), ARW, DRG444(4) SUPR0760
COMMON /FORNOW/ NRM,NALT, RMV(20), ALTV(10), FRNC2(2) SUPR0770
COMMON /NAERO/ TNOZZ, TNZ5(5), DCASE, TNZ17(17), TLTHEO SUPR0780
COMMON /SKINF/ CDSKNF(10), XLBD7, KMANY SUPR0790
COMMON /UPINLT/ PRAMBL(127), CNA, PRAM2(2) SUPR0800
COMMON PSM SUPR0810
COMMON /ALFRLK/ ALF6(6), CDCX, ALF66(6),CLALX SUPR0820
COMMON /ALL/ WORD, IDES, ALL27(27) SUPR0830
COMMON /CMISC/ PARAM SUPR0840
COMMON /CMOPT/ KBYDRG,KBYPAK,KBYPSM,KBYVP SUPR0850
1 ,KBYMCI, INWORLD, KFILL2 SUPR0860
COMMON /CODEXX/ KIND,ITYPE,ISIZE,NODP,KSUS,KFM, SUPR0870
1 IRSTIN,I2I(6), NPASS,MOUT,IXXN SUPR0880
COMMON /DAM/ DIAFR,DAMISC(19) SUPR0890
COMMON /EXTERN/ PLLT,PLEX,D3, RANGX,WTOT,XLTOT,VL, SUPR0900
1 VFOB,DELVI,PLMASS,ARSURF,ARZ(9) SUPR0910
COMMON /EMPT/ HPFM, AMACFM, ALF1FM,FARDEM SUPR0920
COMMON /GOBOL/ DMZZ, WARDZZ(77) SUPR0930
EQUIVALENCE ( WARDZZ(4), ROOTW), ( WARDZZ(18), DMMA ) SUPR0940
COMMON /INDATA/ DIN2(2), WTINLT SUPR0950
COMMON /INSERT/ ZX17(17), TNOZL, ZX15(15) SUPR0960
COMMON /IPROP/ IND, IND3(3) SUPR0970
COMMON /ITERP/ DVTOL,DELDEL,NUMIT,MAXMIT,DVMULT SUPR0980
COMMON /LOOPXX/ LOOPRJ,CENSAV,WTSAB,WSSAV,SLSAV SUPR0990
COMMON /NAMSOL/ DCASEX, XE2(2), STGW, ZLTOT,WMILS,ZLPAY, SUPR1000
1 ZWPAY, ZAR SUP, TTIT4(4) SUPR1010
EQUIVALENCE ( XE2(1), SOLISP ), ( TTIT4(1), SOLTW ), SUPR1020
1 (TTIT4(3), ITHR), ( TTIT4(4), SOLF ) SUPR1030
COMMON /PINT/ FFX3(3), SOLPC, FFX26(26) SUPR1040
COMMON /RJBLCK/ RJ(50) SUPR1050
EQUIVALENCE ( RJ(18), PCMG ) SUPR1060
EQUIVALENCE ( RJ(26), TT4 ) SUPR1070
COMMON /RJDAT/ RJD7(7), BOSTLX, BUMXZ SUPR1080
COMMON/RKBLK/RKX(10),RXXX(30) SUPR1090
COMMON /ROCKET/ RLQSP, RLQMR, RLQX,RLQPC,RLQ31(31), SUPR1100

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1	RLIQTH, RLIQZ, RLIQF, RLIQY	SUPR1110
	COMMON /SUSDAT/ TX(44)	SUPR1120
	COMMON /TRAJX/ TRAQZ(6), FARMAX, TT4MAX, FSLBD, ICCZEN	SUPR1130
	COMMON /TRJCTA/ DPALT(10), DPMACH(10), DPNT(20), DPGAM(10),	SUPR1140
1	DPER(10), DPTTFA(10)	SUPR1150
	COMMON/TURPI/ TV(30)	SUPR1160
	EQUIVALENCE (TV(3), TJALT), (TV(4), TJMACH),	SUPR1170
1	(TV(5), TJTHR), (TV(6), T4TJ)	SUPR1180
COMMON	VPM	SUPR1190
	COMMON /NEWVPM/ TRFIX(102)	SUPR1200
	COMMON /PERF/ SOME(7), NLP haz, NUZ, NUUZ, XMX(80), XPX(10,20),	SUPR1210
1	YPX(10,20), IN(40), IPTYPX(20), RFST(120)	SUPR1220
	COMMON /MULTRJ/ NTRAJ,TRCON(670,5), PROPLT, XNOZ	SUPR1230
1	, TRMOR(102,5), KEMTY	SUPR1240
	DIMENSION TRYSON(670)	SUPR1250
	EQUIVALENCE (TRYSON(1), SOME(1))	SUPR1260
	EQUIVALENCE (TNZ17(12), WWING)	SUPR1270
	COMMON /TOVPER/ DUM555(5), SEXITZ,DUM666(66)	SUPR1280
		SUPR1290
C		SUPR1300
7070	FORMAT(//)	SUPR1310
7071	FORMAT(///)	SUPR1320
	NAMelist /NOTUS/ RMV,ALTV,CDDDES,CLADES,CDSKNF,NODP,	SUPR1330
1	DCASE,TNOZZ,XLPDY,TLTHEO,KSTEP,TOTL	SUPR1340
C		SUPR1350
C	INITIAL SETUP LOGIC	SUPR1360
C		SUPR1370
1	ACODES=1+(NSSTYP-1)/5	SUPR1380
	NCONFIG = 0	SUPR1390
	IF(NSSTYP-24)6,20,3	SUPR1400
3	STEP=1.01	SUPR1410
	WRITE(N6,2000) NSSTYP	SUPR1420
2000	FORMAT(/////5X,29HERROR IN B.V. TABLE - LIST IS , 110	SUPR1430
1	, 2X4HLONG /////)	SUPR1440
	RETURN	SUPR1450
6	LI=NSSTYP+1	SUPR1460
	DO 8 I=LI,20	SUPR1470
8	IL(I)=0	SUPR1480
20	CONTINUE	SUPR1490
	COL=C.O	SUPR1500
	DO 212 I = 1,24	SUPR1510
212	JX(I) = 1	SUPR1520
C		SUPR1530
	KCONFIG = 0	SUPR1540
	KEUPST = 0	SUPR1550
	CIAERT = DIAFR	SUPR1560
	KINDNS = KIND	SUPR1570
	ACDP=1	SUPR1580
	IAIR = IPR(10)	SUPR1590
	IF (IAIR .GT. 1) IAIR = 1	SUPR1600
	IPACK = IPR(11)	SUPR1610
	IVP = IPR(13)	SUPR1620
	ITOT = IPR(14)	SUPR1630
	IALL = IAIR + IPACK + IPSM + IVP	SUPR1640
	IALL = IALL + ITOT	SUPR1650
	7FARMX= FARMAX	

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ZTT4MX = TT4MAX
OVMULS = OVMULT
SAVMAC=ARZ(6)
ZXNRX = ZXNP
C**
C STEP WING AREA
  DO 101 I1=1,IL1
    WAREA = PVIX(1, I1 )
    WAREA = WAREA * 144.
    RX1(1) = WAREA
C STEP TAIL AREA
  DO 102 I2=1,IL2
    TAREA = RVIX ( 2, I2 )
    TAREA = TAREA * 144.
    RX1(2) = TAREA
    TOTAR = WAREA + TAREA
    RATIO = 1.0E+10
    IF ( WAREA .GT. 0.0 ) RATIO = TAREA / WAREA
C STEP EXPOSED WING ASPECT RATIO
  DO 103 I3=1,IL3
    ASPECT = BVIX(3,I3)
    RX1(3) = ASPECT
    TNZ5(1) = TAREA
    TNZ5(4) = WAREA
    ARW = ASPECT
C STEP PAYLOAD LENGTH
  DO 104 I4=1,IL4
    PLCL = BVIX(4,I4)
    RX1(4) = PLCL
    ZLPAY = PLCL
C STEP WARHEAD WT
  DO 105 I5=1,IL5
    WHWT = RVIX(5,I5)
    WHFXXX = WHWT
    RX1(5) = WHWT
C STEP CONTROLS WT
  DO 106 I6=1,IL6
    GUIDWT = RVIX(6,I6)
C CONTROLS WT FOR COSTING
    COM(39) = GUIDWT
    GUIDWT = GUIDWT + WTGUID
    RX1(6) = GUIDWT
    NVAR = 10
    CALL SLU(NVAR,ZGWTT,ZCEP,WTGUID,CEP,ILO,IHI)
C STEP MISSILE DIAM
  DO 107 I7 = 1, IL7
    TOTDIA = BVIX(7,I7)
    D3 = TOTDIA
    D3X = D3
    ECASEX = D3
    POSTLX = 2. * D3
    A3 = .7854 * D3**2 / 144.
    SPEFS = A3
    CM77 = DIAFR * D3
    WARDZ7(18) = D3

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SUPR1660
SUPR1670
SUPR1680
SUPR1690
SUPR1700
SUPR1710
SUPR1720
SUPR1730
SUPR1740
SUPR1750
SUPR1760
SUPR1770
SUPR1780
SUPR1790
SUPR1800
SUPR1810
SUPR1820
SUPR1830
SUPR1840
SUPR1850
SUPR1860
SUPR1870
SUPR1880
SUPR1890
SUPR1900
SUPR1910
SUPR1920
SUPR1930
SUPR1940
SUPR1950
SUPR1960
SUPR1970
SUPR1980
SUPR1990
SUPR2000
SUPR2010
SUPR2020
SUPR2030
SUPR2040
SUPR2050
SUPR2060
SUPR2070
SUPR2080
SUPR2090
SUPR2100
SUPR2110
SUPR2120
SUPR2130
SUPR2140
SUPR2150
SUPR2160
SUPR2170
SUPR2180
SUPR2190
SUPR2200

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TNAZZL = D3 / 2.	SUPR2210
IF (KBYPSM .GT. 0) TNAZZL = XNOZ	SUPR2220
RX1(7) = TOTDIA	SUPR2230
INTYPE = ITYPE	SUPR2240
KFAIL = 0	SUPR2250
IMO I = 0	SUPR2260
C SIZE & PACKAGE PAYLOAD	SUPR2270
CALL PAYLOD(KFAIL, IMO I)	SUPR2280
WPAY = WPAYI	SUPR2290
PLMASS = WPAY	SUPR2300
ZWPAY = WPAY	SUPR2310
IF(KFAIL .GT. 0) GO TO 107	SUPR2320
6957 CONTINUE	SUPR2330
DMAX = D3	SUPR2340
C VARY BOOSTER T/W	SUPR2350
DO 1071 I8 = 1, IL8	SUPR2360
BOOTW = BVIX(8,I8)	SUPR2370
C VARY L&S F OR T/W.....OR.....RAMJET DESIGN ALT	SUPR2380
C OR TURBOJET DESIGN ALT	SUPR2390
DO 1072 I9 = 1, IL9	SUPR2400
VAR1 = BVIX(9,I9)	SUPR2410
C VARY L&S ISP.....OR.....RAMJET DESIGN MACH NO.	SUPR2420
C OR TURBOJET DESIGN MACH NO.	SUPR2430
DO 1073 I10 = 1, IL10	SUPR2440
VAR2 = BVIX(10,I10)	SUPR2450
C VARY L&S CHAMBER PRESSURE ...OR... RAMJET DESIGN GAMMA	SUPR2460
C OR TURBOJET DESIGN THRUST	SUPR2470
DO 1074 I11 = 1, IL11	SUPR2480
VAR3 = BVIX(11,I11)	SUPR2490
C VARY LIQUID MIXTURE RATIO (NO SOLID) ...OR... RAMJET DESIGN TT4	SUPR2500
C OR TURBOJET DESIGN T4 (TURBINE INLET TEMP)	SUPR2510
DO 1075 I12 = 1, IL12	SUPR2520
VAR4 = BVIX(12,I12)	SUPR2530
IF (KIND .GT. 49) GO TO 1077	SUPR2540
IF (KIND .GE. 40) GO TO 1079	SUPR2550
IF (KIND .GE. 20) GO TO 1078	SUPR2560
IF (ITHR .LE. 0) SOLF = VAR1	SUPR2570
IF (ITHR .GT. 0) SOLTW = VAR1	SUPR2580
SOLISP = VAR2	SUPR2590
SOLPC = VAR3	SUPR2600
GO TO 1080	SUPR2610
1077 CONTINUE	SUPR2620
TJALT = VAR1	SUPR2630
TJMACH = VAR2	SUPR2640
TJTHR = VAR3	SUPR2650
T4TJ = VAR4	SUPR2660
GO TO 1080	SUPR2670
1078 CONTINUE	SUPR2680
IF (ITHR .LE. 0) RLIQF = VAR1	SUPR2690
IF (ITHR .GT. 0) RLIQTW = VAR1	SUPR2700
RLIQSP = VAR2	SUPR2710
RLIQPC = VAR3	SUPR2720
RLIQMP = VAR4	SUPR2730
GO TO 1080	SUPR2740
1079 CONTINUE	SUPR2750

CPALT(1)= VAR1	SUPR2760
HPFM = VAR1	SUPR2770
C SFT HEIGHT FOR INLETP AND CDINLT	SUPR2780
APZ(7) = VAR1	SUPR2790
CPMACH(1)= VAR2	SUPR2800
AMACFM = VAR2	SUPR2810
CPGAM(1)= VAR3	SUPR2820
CPITFA(1) = VAR4	SUPR2830
TT4 = VAR4	SUPR2840
1080 CONTINUE	SUPR2850
RX1(8) = BOOTH,	SUPR2860
RX1(9) = VAR1	SUPR2870
RX1(10) = VAR2	SUPR2880
RX1(11) = VAR3	SUPR2890
RX1(12) = VAR4	SUPR2900
C RAMJET DESIGN FRACTION FUEL CONSUMED	SUPR2910
DO 1176 I13=1, I113	SUPR2920
CPFR(1)=PVIX(13, I13)	SUPR2930
C R/J DESIGN NORMAL ACCELERATION	SUPR2940
DO 1177 I14=1, I114	SUPR2950
CPNT(1)=PVIX(14, I14)	SUPR2960
C R/J DESIGN TANGENTIAL ACCELERATION	SUPR2970
DO 1178 I15=1, I115	SUPR2980
CPNT(11) = PVIX(15, I15)	SUPR2990
C RAMJET DESIGN PRESSURE MARGIN	SUPR3000
DO 1179 I16=1, I116	SUPR3010
PCMGN=PVIX(16, I16)	SUPR3020
C STEP MISSILE WT OR LENGTH	SUPR3030
DO 118 I17=1, I117	SUPR3040
RINX = PVIX(17, I17)	SUPR3050
TT4 = VAR4	SUPR3060
RX1(13) = RINX	SUPR3070
PARAM = RINX	SUPR3080
C**	SUPR3090
C TEST FOR COMPATIBILITY MATRIX	SUPR3100
DOL=DOL+1.0	SUPR3110
IF (AMOD(DOL, 1000.) .EQ. 0.0) WRITE(N6, 2010) DOL	SUPR3120
2010 FORMAT(6X, 4H DOL=, 1PE15.7)	SUPR3130
IF (AMOD(DOL, 1000.) .NE. 0.0) GO TO 60	SUPR3140
WRITE (N6, 2010) DOL	SUPR3150
WRITE (N6, 2004) (JX(I), I=1, NSSTYP)	SUPR3160
2004 FORMAT (6X, 6(5I3, 2X))	SUPR3170
60 CONTINUE	SUPR3180
IF (NICOMA .LT. 0) GO TO 6420	SUPR3190
C	SUPR3200
DO 62 I = 1, NICOMA	SUPR3210
K=IS1(I)	SUPR3220
L=IS2(I)	SUPR3230
M=IR(I)	SUPR3240
N=IC(I)	SUPR3250
K1=JX(K)	SUPR3260
K2=JX(L)	SUPR3270
IF ((K1.EQ.0).OR.(K2.EQ.0)) GO TO 300	SUPR3280
K3=ICM(K1, K2, I)	SUPR3290
IF (M*N.EQ.0) K3=-1	SUPR3300

IF(K3.EQ.0) GO TO 66	SUPR3310
62 CONTINUE	SUPR3320
6420 CONTINUE	SUPR3330
DO 64 I=1,NSSTYP	SUPR3340
JX1(I)=JX(I)	SUPR3350
IF (IL(I).EQ.0) JX1(I)=0	SUPR3360
64 CONTINUE	SUPR3370
C GO TO HERE IF COMPATIBLE	SUPR3380
ICNO = IABS(IAIR) + IABS(IPR(12)) + IABS(IVP)	SUPR3390
IF (ICNO .EQ. 0) GO TO 7842	SUPR3400
CALL PACE	SUPR3410
NCF = NCONFIG + 1	SUPR3420
WRITE (6, 7841) NCF	SUPR3430
7841 FORMAT (/// 5X, 30HSEARCH FOR CONFIGURATION NO. , 15)	SUPR3440
NCONOT = -47	SUPR3450
CALL HACKCM (IX, KCONFIG , NCONOT)	SUPR3460
7842 CONTINUE	SUPR3470
C**	SUPR3480
APZ(6)=CPMACH(1)	SUPR3490
IF (INWORL .GT. 0) GO TO 7345	SUPR3500
C SIZE ON TOTAL WT	SUPR3510
LWOPT = 2	SUPR3520
TOTWT = RINX	SUPR3530
WTTOT = TOTWT	SUPR3540
IF (KBYPSM .GT. 0) GO TO 7347	SUPR3550
PROPL = 0.0	SUPR3560
TOTL = PLCL	SUPR3570
XLBDY = 2. * PLCL	SUPR3580
IF (PROPLT .GT. 0.) XLBDY = PROPLT	SUPR3590
GO TO 7349	SUPR3600
7345 CONTINUE	SUPR3610
C SIZE ON LENGTH	SUPR3620
LWOPT = 1	SUPR3630
TOTL = RINX	SUPR3640
PROPL = TOTL - PLCL	SUPR3650
XLBDY = PROPL	SUPR3660
TOTWT = 0.0	SUPR3670
WTTOT = 3. * WPAY	SUPR3680
IF (KBYPSM .LE. 0) GO TO 7349	SUPR3690
WRITE(6,7346)	SUPR3700
7346 FORMAT(// 2X36HPROPULSION SIZING CANNOT BE BYPASSED /	SUPR3710
1 2X30HMUST SIZE TO WEIGHT NOT LENGTH)	SUPR3720
GO TO 9999	SUPR3730
7347 CONTINUE	SUPR3740
PROPL = PROPLT	SUPR3750
XLBDY = PROPLT	SUPR3760
7349 CONTINUE	SUPR3770
CUM666(2) = TOTWT	SUPR3780
7777 CONTINUE	SUPR3790
C	SUPR3800
STGW = TOTWT	SUPR3810
ZLTOT = XLBDY	SUPR3820
D3 = TOTDIA	SUPR3830
DCASE = D3	SUPR3840
TNOZZ = D3 / 2.	SUPR3850

APZ(5)=DPMACH(1)	SUPR3860
APZ(8)=PROPLT/2.	SUPR3870
TX(33)=PROPLT/2.	SUPR3880
DUM666(9)=D3	SUPR3890
RJ07(5)=DUM666(8)	SUPR3900
IF (KBYPSM .LE. 0) SEXITZ = A3 * .9	SUPR3910
IF (KBYPSM .GT. 0) TNOZZ = XNOZ	SUPR3920
XLTOT = XLBDY + PLCL	SUPR3930
TNOZL = TNOZZ	SUPR3940
TLTHEO = XLBDY + PLCL	SUPR3950
XDITP = (TLTHEO - DCASE/2.) / DCASE	SUPR3960
C COMPUTE WING/TAIL WTS	SUPR3970
CALL AEPWT (ARSURF)	SUPR3980
ZARSUR = ARSURF	SUPR3990
IF (IPACK .GT. 0) CALL PAGE	SUPR4000
WTAI = ARSURF - WWING	SUPR4010
IF (ICNO .NE. 0) WRITE(6,7851) WPAY, WWING, WTAI	SUPR4020
7851 FORMAT(// 5X,14HPAYLOAD WEIGHT, F9.1 /	SUPR4030
1 5X,11HWING WEIGHT , F12.1 / 5X,11HTAIL WEIGHT , F12.1 /)	SUPR4040
XLBDZ = TLTHEO	SUPR4050
C	SUPR4060
C TEST TO BYPASS ADM STEP	SUPR4070
IF(KBYPSM.GT.0) GO TO 4923	SUPR4080
IF (KIND .LT. 40) GO TO 4923	SUPR4090
IF (KIND .GT. 49) GO TO 4923	SUPR4100
C COMPUTE LIFT/DRAG COEF FOR DESIGN PTS	SUPR4110
DO 8172 IPN = 1, 10	SUPR4120
8172 CESKNF(IPN) = 0.0	SUPR4130
IF (KBYDRG .GT. 1) GO TO 4923	SUPR4140
KSTEP = 1	SUPR4150
NRMSAV = NRM	SUPR4160
NRM = 1	SUPR4170
NALTSV = NALT	SUPR4180
NALT = 1	SUPR4190
RMVSAV = RMV(1)	SUPR4200
ALTSV = ALTV(1)	SUPR4210
IAIRS = IAIR	SUPR4220
IF (IAIRS.LE.0) IAIR = 0	SUPR4230
DO 4921 IJK = 1, NODP	SUPR4240
RMV(1) = DPMACH(IJK)	SUPR4250
ALTV(1) = DPALT(IJK)	SUPR4260
C CALL AERO TO COMPUTE CDD & CLAFD FOR DESIGN POINTS	SUPR4270
CALL ADM(KFAIL, KSTEP)	SUPR4280
CODES(IJK) = CDD	SUPR4290
CLADES(IJK) = CNA / 57.29578	SUPR4300
CESKNF(IJK) = CFR	SUPR4310
C ADJUST ROATTAIL CDD FOR CHANGE IN NOZ LT	SUPR4320
CDDOAT(IJK)=CDDPTI	SUPR4330
4921 CONTINUE	SUPR4340
NRM = NRMSAV	SUPR4350
NALT = NALTSV	SUPR4360
RMV(1) = RMVSAV	SUPR4370
ALTV(1) = ALTSV	SUPR4380
IAIR=IAIRS	SUPR4390
IF (IAIR .EQ. 0) GO TO 4923	SUPR4400

WRITE(N6,4931)	SUPR4410
4931 FORMAT (// 5X,22HDESIGN POINT AERO DATA //	SUPR4420
1 5X5HPOINT, 7X3HALT, 3X4HMACH, 3X6HCDDDES,	SUPR4430
2 3X6HCLADES, 3X6HCOSKNF)	SUPR4440
WRITE (N6,4933) ((IDE, DPALT(IDE), DPMACH(IDE), CDDDES(IDE),	SUPR4450
1 CLADES(IDE), COSKNF(IDE)) , IDE=1, NODP)	SUPR4460
4933 FORMAT(5X,I5,F10.0, F7.2, 3F9.4)	SUPR4470
CALL PAGE	SUPR4480
4923 CONTINUE	SUPR4490
CDX = CDDDES(1)	SUPR4500
CLALX = CLADES(1)	SUPR4510
C	SUPR4520
IPSM=IPR(12)	SUPR4530
KLIMIT = 1	SUPR4540
IF((KBYPSP.GT.0) .OR. (KBYPV.GT.0)) KLIMIT = 0	SUPR4550
IF((IPSM.NE.-2) .OR. (IAIR.GT.0) .OR. (IVP.GT.0)) KLIMIT = 0	SUPR4560
KIPSM = IPSM	SUPR4570
KIAIR = IAIR	SUPR4580
KIVP = IVP	SUPR4590
C TEST TO BYPASS PSM	SUPR4600
IF((KBYPSP.GT.0) .AND. (KBYPV.GT.0)) GO TO 163	SUPR4610
IF (KBYPSP .GT. 0) GO TO 7679	SUPR4620
C SIZE PROPULSION SYSTEM	SUPR4630
IRT = 0	SUPR4640
IFLY = 0	SUPR4650
KWUN = 0	SUPR4660
DELVSU = VEDR - VL	SUPR4670
DELVI = DELVSU * DVMULT	SUPR4680
VDD=0.	SUPR4690
VDD=0.	SUPR4700
LOOPRJ=0	SUPR4710
C VALUES SET SAFE	SUPR4720
CFNSAV=.2	SUPR4730
WTSAB=3.*WPAY	SUPR4740
WSSAV = TOTWT / 3.	SUPR4750
SLSAV = TOTL / 3.	SUPR4760
ISIZE = LWOPT	SUPR4770
NUMZIT=1	SUPR4780
NUMIT=1	SUPR4790
162 CONTINUE	SUPR4800
IF (INWORL .LE. 0) GO TO 163	SUPR4810
XLTOT = TOTL	SUPR4820
GO TO 164	SUPR4830
163 CONTINUE	SUPR4840
WTTOT = TOTWT	SUPR4850
164 CONTINUE	SUPR4860
PLLT = PLCL	SUPR4870
D3 = TOTDIA	SUPR4880
A3 = .7854 * D3 ** 2 / 144.	SUPR4890
ARZ(1) = A3	SUPR4900
NPASS = 0	SUPR4910
MODEL = 0	SUPR4920
IPSM = IPR(12)	SUPR4930
IDES = 1	SUPR4940
IF(KBYPSP.LE.0) GO TO 165	SUPR4950

IF((KIND.LT.40) .OR. (KIND.GT.49)) GO TO 7679	SUPR4960
NCUT=IPSM	SUPR4970
IND=0	SUPR4980
CALL INLETP	SUPR4990
IF(IND.NE.0) GO TO 108	SUPR5000
GO TO 7679	SUPR5010
165 CONTINUE	SUPR5020
C	SUPR5030
IF(IPSM.NE.0) WRITE(N6,5111) NUMZIT, DELVI	SUPR5040
5111 FORMAT(/////5X,8HLOOP NO., I3,2X29HCN BOOSTER DELIVERED VELOCITY	SUPR5050
1 // 5X,26HIDEAL VELOCITY ASSIGNED AS ,F10.1, 2X3HFPS/////)	SUPR5060
IF(IPSM.NE.0) WRITE(N6,5520)	SUPR5070
5520 FORMAT(/5X,37HGO DESIGN AND SIZE PROPULSION SYSTEMS /)	SUPR5080
C SIZE PROP SYSTEM	SUPR5090
PCMGN = RVIX(16,116)	SUPR5100
IF (KLIMIT .GT. 0) IPSM = 0	SUPR5110
IF((IPSM.NE.0) .AND. (KLIMIT.LT.0)) CALL PAGE	SUPR5120
CALL PSM (IRT, IFLY)	SUPR5130
IPSM = KIPSM	SUPR5140
C	SUPR5150
FARMAX = ZFARMX	SUPR5160
TT4MAX = ZTT4MX	SUPR5170
LOOPRJ = 1	SUPR5180
IF (IFLY .GT. 0) WRITE(N6,3110)	SUPR5190
3110 FORMAT(///// 5X,31HMISSILE SYNTHESIS FAILED IN PSM //)	SUPR5200
IF (IFLY .GT. 0) GO TO 108	SUPR5210
IF(IPSM.NE.0) WRITE(N6,5522)	SUPR5220
5522 FORMAT(/5X,24HPROPULSION STEP COMPLETE /)	SUPR5230
7679 CONTINUE	SUPR5240
C	SUPR5250
D3 = TOTDIA	SUPR5260
C TEST TO BYPASS ADM STEP	SUPR5270
IF (KBYDRG .GT. 0) GO TO 6753	SUPR5280
KFAIL = 0	SUPR5290
KSTEP = 2	SUPR5300
TLTHFO = XLTOT	SUPR5310
TNOZZ = TNOZL	SUPR5320
C PACK FULL AERO TABLES	SUPR5330
IF(IAIP.NE.0) WRITE(N6,5524)	SUPR5340
5524 FORMAT(/5X,30HGO COMPUTE AERO LIFT/DRAG DATA /)	SUPR5350
IF (KLIMIT .GT. 0) IAIR = 0	SUPR5360
CALL ADM(KFAIL, KSTEP)	SUPR5370
IAIR = KIAIR	SUPR5380
IF (KFAIL .GT. 0) WRITE(N6,3111)	SUPR5390
3111 FORMAT(///// 5X,31HMISSILE SYNTHESIS FAILED IN ADM //)	SUPR5400
IF (KFAIL .GT. 0) GO TO 103	SUPR5410
IF(IAIR.NE.0) WRITE(N6,5526)	SUPR5420
5526 FORMAT(/5X,18HAERO STEP COMPLETE /)	SUPR5430
6753 CONTINUE	SUPR5440
C	SUPR5450
D2 = TOTDIA	SUPR5460
IF((KBYPSP.GT.0) .OR. (KBYPVP .GT. 0)) GO TO 3909	SUPR5470
IF (MAXNIT .LE. 0) GO TO 3909	SUPR5480
IF (KWUN .GT. 0) GO TO 2909	SUPR5490
DO 2907 I = 1, NLPHAZ	SUPR5500

INL = I	SUPR5510
IPTYPE = IPTYPX(I)	SUPR5520
IF ((IPTYPE.EQ.1) .OR. (IPTYPE.EQ.2)) GO TO 2908	SUPR5530
2907 CONTINUE	SUPR5540
GO TO 3909	SUPR5550
2908 CONTINUE	SUPR5560
NLPSAV = NLPHAZ	SUPR5570
NLPHAZ = INL	SUPR5580
KWUN = 1	SUPR5590
2909 CONTINUE	SUPR5600
MODEL=1	SUPR5610
KFURST=0	SUPR5620
C HACK DELIVERED VEL TO SEE IF SUFF	SUPR5630
C BCCSTER PHASE ONLY	SUPR5640
IF (IPSM.NE.0) WRITE(N6,5528)	SUPR5650
5528 FORMAT(/5X48HCOMPUTE DELIVERED VELOCITY BY FLYING BCCST PHASE /)	SUPR5660
IF (KLIMIT .NE. 0) IVP = 0	SUPR5670
CALL VEHPR(KFURST,KFAIL)	SUPR5680
IVP = K IVP	SUPR5690
IF ((KLIMIT.LT.1).AND.(IVP.NE.3).AND.(IVP.NE.0)) CALL PAGE	SUPR5700
IF (KFAIL .GT. 0) WRITE(N6,3112)	SUPR5710
3112 FORMAT(///// 5X,34HMISSILE SYNTHESIS FAILED IN VEHPR /////)	SUPR5720
IF (KFAIL .GT. 0) GO TO 108	SUPR5730
VACT=RKX(3) - VL	SUPR5740
DELDEL =DELVSV - VACT	SUPR5750
IF (ABS(DELDEL) .LE. DVTOL) GO TO 3908	SUPR5760
IF (NUMZIT.GT.MAXNIT) WRITE(N6,3113) NUMZIT	SUPR5770
3113 FORMAT(5X,34HFAILED TO CONVERGE ON DEL. VEL. IN,	SUPR5780
1 15, 2X4HTRYS ///	SUPR5790
IF (NUMZIT .GT. MAXNIT) GO TO 108	SUPR5800
C LOOP TO REFINE PROP SYSTEM	SUPR5810
NUMZIT = NUMZIT + 1	SUPR5820
NUMIT = NUMZIT	SUPR5830
DVRAT = (DELVI - VIO) / (VACT - VDO)	SUPR5840
DVRATT = DVRAT * (VACT - DELVSV)	SUPR5850
DVWANT = DELVI - DVRATT	SUPR5860
VIO = DELVI	SUPR5870
VDO = VACT	SUPR5880
DELVI = DVWANT	SUPR5890
3907 CONTINUE	SUPR5900
IF (IPSM.NE.0) WRITE(N6,5530) DELDEL	SUPR5910
5530 FORMAT(/5X28HDELIVERED VELOCITY MISSED BY , F10.1, 2X3HFPS /)	SUPR5920
C GO TO REFINE PROPULSION SIZING BASED ON NEW DELTA V GUESS	SUPR5930
GO TO 162	SUPR5940
3908 CONTINUE	SUPR5950
IF (KLIMIT .LE. 0) GO TO 3919	SUPR5960
KLIMIT = -1	SUPR5970
GO TO 3907	SUPR5980
3919 CONTINUE	SUPR5990
DELVI = DELVSV	SUPR6000
NLPHAZ = NLPSAV	SUPR6010
IF (IPSM.NE.0) WRITE(N6,5532) DELDEL	SUPR6020
5532 FORMAT(/5X,38HDELIVERED VELOCITY CONVERGED - MISS IS , F10.1,	SUPR6030
1 2X3HFPS /)	SUPR6040
3909 CONTINUE	SUPR6050

C	LOOP COMPLETE	SUPR6060
C	FINAL PROP SYSTEM	SUPR6070
	KFAIL = 0	SUPR6080
C	TEST TO BYPASS MOI HACK	SUPR6090
	IF (KPYMOI .GT. 0) GO TO 8522	SUPR6100
	IMOI = 1	SUPR6110
C	COMPUTE MOI TERMS	SUPR6120
	CALL PAYLOD(KFAIL, IMOI)	SUPR6130
	IF (KFAIL .GT. 0) GO TO 108	SUPR6140
	KSTEP = 3	SUPR6150
C	HACK MOI TERMS FOR AERO SYS	SUPR6160
	CALL ADM(KFAIL, KSTEP)	SUPR6170
1186	CONTINUE	SUPR6180
8522	CONTINUE	SUPR6190
	CALL COSTWT(COSNX, WTTOT)	SUPR6200
C		SUPR6210
C	PACKAGING TESTS	SUPR6220
	IF (KRYPAK .LE. 0) CALL PACKER (KFAIL)	SUPR6230
	IF (KFAIL .GT. 0) WRITE(N6,3114)	SUPR6240
3114	FORMAT(///// 5X,34HMISSILE DOES NOT FIT LAUNCHER //////)	SUPR6250
	KFAIL = 0	SUPR6260
	CC 7940 ITR=1, NTRAJ	SUPR6270
	CMAXD = 0.0	SUPR6280
	VMAXD = 0.0	SUPR6290
	IF (KBYVP .GT. 0) GO TO 7680	SUPR6300
	MODEL = 1	SUPR6310
	KFURST=0	SUPR6320
	ICES = 0	SUPR6330
C	JUGGLE SEGMENTS	SUPR6340
	CALL COSTWT(COSNX, WTTOT)	SUPR6350
C	FINAL PERFORMANCE HACK	SUPR6360
	IF (IVP .NE. 0) WRITE(N6,5534) ITR	SUPR6370
5534	FORMAT(15X30HGO FLY COMPLETE TRAJECTORY NO. , I5 /)	SUPR6380
	CALL VEHPR(KFURST,KFAIL)	SUPR6390
	IF(IVP.NE.0) WRITE(N6,5536)	SUPR6400
5536	FORMAT(/5X,24HTRAJECTORY STEP COMPLETE /)	SUPR6410
	IF (KFAIL .GT. 0) WRITE(N6,3112)	SUPR6420
	IF(KFAIL.GT.0) GO TO 752C	SUPR6430
7680	CONTINUE	SUPR6440
	D3 = JOTDIA	SUPR6450
C	**	SUPR6460
C	COMPUTE COST (UNIT)	SUPR6470
	AX = PLMASS - GUIDWT - WHWT + ARSURF	SUPR6480
	IF((KIND.GT.20) .AND. (KIND.LT.30)) AX = AX + WSECT	SUPR6490
	IF (KIND .GT. 40) AX = AX + WTINLT	SUPR6500
	NCONFG=NCONFG + 1	SUPR6510
	NCONEX = NCONFG	SUPR6520
	COSN = COSNX	SUPR6530
	IF (KPYCST .GT. 0) GO TO 3719	SUPR6540
	CALL COST(ICND)	SUPR6550
	IF((NSCRC.LE.0) .AND. (NSCOST.LE.1)) COSN = CPTCT	SUPR6560
	IF((NSCRC.LE.0) .AND. (NSCOST.EQ.2)) COSN = CRTCT	SUPR6570
	IF((NSCRC.LE.0) .AND. (NSCOST.GE.3)) COSN = CTOT	SUPR6580
C		SUPR6590
2719	CONTINUE	SUPR6600

EMPTY = WHWT	SUPR6610
CALL WORTH (WTH1, WTH2, EMPTY)	SUPR6620
C	SUPR6630
C	SUPR6640
C	SUPR6650
C	SUPR6660
**	SUPR6670
NCONOT = 0	SUPR6671
IXXY = 1	SUPR6672
IF (ICNO .EQ. 0) IXXY = 0	SUPR6680
CALL HACKCM (IXXY, KCONFIG, NCONOT)	SUPR6690
C CONCEPT OK	SUPR6700
IF (KBYVP .GT. 0) GO TO 7960	SUPR6710
7920 CONTINUE	SUPR6720
IF (NTRAJ .LE. 1) GO TO 7960	SUPR6730
IF (ITR .GE. NTRAJ) GO TO 7940	SUPR6740
IF (IVP .NE. 0) CALL PAGE	SUPR6750
ITRP = ITR + 1	SUPR6760
C RESET TRAJ PARAM FROM STORAGE FOR NEXT TRAJ	SUPR6770
DO 1976 I=1,102	SUPR6780
1976 TRFIX(I) = TRMOR(I,ITRP)	SUPR6790
KEMTY=0	SUPR6800
DO 7930 I = 1, 670	SUPR6810
7930 TRYSOM(I) = TRCON(I,ITRP)	SUPR6820
7940 CONTINUE	SUPR6830
C RESET TRAJ PARAM FOR FIRST TRAJ	SUPR6840
DO 1977 I=1,102	SUPR6850
1977 TRFIX(I) = TRMOR(I,1)	SUPR6860
DO 7950 I = 1, 670	SUPR6870
7950 TRYSOM(I) = TRCON(I,1)	SUPR6880
7960 CONTINUE	SUPR6890
GO TO 108	SUPR6900
C	SUPR6910
C GO TO HERE IF NOT COMPATIBLE	SUPR6920
C FAILED COMPATIBILITY TEST---CONTINUE LOOPING	SUPR6930
66 K4 = MAXO(K,L)	SUPR6940
IF (K4 .EQ. 0) GO TO 302	SUPR6950
IF (K4 .GT. 8) GO TO 108	SUPR6960
GO TO (101, 102, 103, 104, 105, 106, 107, 108) , K4	SUPR6970
9876 CONTINUE	SUPR6980
9879 FORMAT(10X22HTABLE EXCEEDED AT STEP, 615//(20X8G12.5))	SUPR6990
108 CONTINUE	SUPR7000
JX2(17)=I17	SUPR7010
118 CONTINUE	SUPR7020
1179 JX2(16)=I16	SUPR7030
1178 JX2(15)=I15	SUPR7040
1177 JX2(14)=I14	SUPR7050
1176 JX2(13)=I13	SUPR7060
1075 JX2(12) = I12	SUPR7070
1074 JX2(11) = I11	SUPR7080
1073 JX2(10) = I10	SUPR7090
1072 JX2(9) = I9	SUPR7100
1071 JX2(8) = I8	SUPR7110
107 JX2(7)=I7	SUPR7120
106 JX2(6)=I6	SUPR7130
105 JX2(5)=I5	

104	JX2(4)=I4	SUPR7140
103	JX2(3)=I3	SUPR7150
102	JX2(2)=I2	SUPR7160
101	JX2(1)=I1	SUPR7170
9999	CONTINUE	SUPR7180
	APZ(6)=SAVMAC	SUPR7190
	DVMULT = DVMULS	SUPR7200
	RETURN	SUPR7210
300	WRITE (N6,2006) K1,K2	SUPR7220
2006	FORMAT (6X,3HK1=, I5, 3HK2=, I5)	SUPR7230
	RETURN	SUPR7240
302	WRITE (N6,2008) K4	SUPR7250
2008	FORMAT (6X,3HK4=, I5)	SUPR7260
	RETURN	SUPR7270
	END	SUPR7280

SUBROUTINE HACKCM (IX, KCONFIG, NCONOT)		HACK0010
C	NUK.CM-CGSM R.K.MCDONOUGH FIV/EBCD 10/18/73	HACK0020
C	HACKCM WRITES DATA	HACK0030
	COMMON /COSTSC/ COSDUM(20)	HACK0040
	COMMON/GUIDCO/COSTX,CDUM59(59)	HACK0050
	COMMON /ALFPLK/ ALF6(6), CDD, ALF66(6), CLA	HACK0060
	COMMON /BESYET/ FACTOR,WBTO,BLUB,BLENG,BES11(11)	HACK0070
	COMMON /BYAIR/ A3, RV8CC(800)	HACK0080
	COMMON /CMOPT/ KM6(6), KFIL12	HACK0090
	COMMON /CODEXX/ KIND,IFN(15)	HACK0100
	INTEGER*2 ICM	HACK0110
	COMMON /CSET3/ KASE,KLIDUM(30), BAUXV(16,10),BTC(4,30),	HACK0120
1	BVIX(24,16),NTB(34),BT(10,10,30), ICM(16,16,10)	HACK0130
	COMMON /EXTERN/ PLLT, PLEX, DRVC(2), WTTOT, XLTOT,VL,VEOP,	HACK0140
1	DELVI, PLMASS, ARSURF, ARZ(9)	HACK0150
	COMMON/FILING/ KONPL, KSAVPL, KZIM	HACK0160
	COMMON /INDATA/ CD2(2), WTINLT	HACK0170
	COMMON /INDATX/ FPROJ, HC, WC, ANGK6(6), XLE, ANGK13(13)	HACK0180
	COMMON /INDU12 / JD12,ND12, NB12	HACK0190
	COMMON /INSERT/ BO31(31), WTNOZ, XISPV	HACK0200
	COMMON /LIQOUT/ XLTP, WTP, WOXTNK, WFTANK,	HACK0210
1	XLTOX,WOX, XLTF,WF, XLPS, WPROPI, WNOZ	HACK0220
	COMMON /NAERC/ DUM18(18),WWING, DUM6(6)	HACK0230
	COMMON /NAMSOL/ SOL11(11), ITHR, FDES	HACK0240
	COMMON /NFILES/ N5,N6,N7,N11,N12,N1	HACK0250
	COMMON /PRINTR/ IOP6(6), IALL	HACK0260
	COMMON /RJCAT/ CFN2(2), AAAA(3) , SFC,BOSTWT,BCSTLT,BOSTPR	HACK0270
	COMMON /ROUNDPR/ PRNG(20),WORTH,CEP,RANGE,RCR,ACR,VCR,	HACK0280
1	RLI,ALL,VLL, RUF14(14)	HACK0290
	COMMON /SCREEN/ NLEVEL,LWTM1,LWTM2, NUT6(6)	HACK0300
	COMMON /SEPOWR/ WTSP, SEP47(47)	HACK0310
	COMMON /SOLR/ WVEH,WM,SOL4(4), DEXIT,WP	HACK0320
	COMMON /SOLSAV/ PMF, WPOVWO, WN, WINERT	HACK0330
	COMMON /SURFX/ DUMX18(18),WTAII, DUMX6(6)	HACK0340
	COMMON /SUSDAT/ TX32(32), SUSLT, SUSWT, TX10(10)	HACK0350
	EQUIVALENCE (TX32(24), WFMB)	HACK0360
	COMMON /SY1/MCODE(6),NCODES,NCONFIG	HACK0370

COMMON /TEMP/ JXX(560),I1,I2,I3, I4, I5, I6, I7, I8, I9,	HACK0380
1 I10, I11, I12, I13, I14, I15, I16, JXXX(8)	HACK0390
COMMON /TOVPER/ WPROPZ,XISPB,TVACB,AFXB,WPROPS,AEXS,DUMPE,	HACK0400
1 WTFIN,WDRDP,WDRDPE, KIZ, A5A3,A6A3,ACA3,D3	HACK0410
2 , EXTRA(57)	HACK0420
EQUIVALENCE (EXTRA(57), XLM)	HACK0430
COMMON /ZWORTH/ZCEP(10),FORCE, ZGWT(10), RELIB, NLLPT, ZW9(9)	HACK0440
EQUIVALENCE (ZWS(8), WTH1), (ZW9(9), WTH2)	HACK0450
EQUIVALENCE (KASE,KAS), (NCONFJ,JCONFJ)	HACK0460
EQUIVALENCE (I17, JXXX(1))	HACK0470
DIMENSION TAPE(100)	HACK0480
C	HACK0490
C**	HACK0500
WPROPR = WPROPZ	HACK0510
IF (NCONOT .EQ. -47) GO TO 666	HACK0520
WTM1 = FLOAT(LWTM1)	HACK0530
WTM2 = FLOAT(LWTM2)	HACK0540
IF (NCONOT .GT. 0) GO TO 6000	HACK0550
NTEN = 10	HACK0560
NKIND = MOD (KIND, NTEN)	HACK0570
KINDT = KIND / NTEN	HACK0580
GO TO (100,100,100,400,100) , KINDT	HACK0590
100 CONTINUE	HACK0600
BOOL = BL ENG	HACK0610
BOOW = WBTO	HACK0620
POSTWT = BOOW	HACK0630
SUSW = WITOT - PLMASS - ARSURE	HACK0640
SUSW = SUSW - POSTWT	HACK0650
SUSL = XLTOT - PLIT	HACK0660
GO TO 600	HACK0670
400 CONTINUE	HACK0680
KINM = KIND - 40	HACK0690
GO TO (410,100,420,100) , KINM	HACK0700
410 CONTINUE	HACK0710
420 CONTINUE	HACK0720
BOOL = POSTLT	HACK0730
BOOW = POSTWT	HACK0740
SUSL = SUSLT	HACK0750
SUSW = WITOT - PLMASS - ARSURE - BOOW	HACK0760
600 CONTINUE	HACK0770
IF ((NKIND.EQ.3) .OR. (KIND.EQ.41)) GO TO 654	HACK0780
BOOL = 0.	HACK0790
BOOW = 0.	HACK0800
WPROPR = 0.	HACK0810
654 CONTINUE	HACK0820
TAPE(58) = WNOZ	HACK0830
AC = A3 * ACA3	HACK0840
WORTH = (WTH1*WTM1 + WTH2*WTM2) / (WTM1 + WTM2)	HACK0850
TAPE(1)= NCONFJ	HACK0860
TAPE(2)= WITOT	HACK0870
TAPE(3)= WWING	HACK0880
TAPE(4)= RCR	HACK0890
TAPE(5)= ACP	HACK0900
TAPE(6)= VCR	HACK0910
TAPE(7)= WORTH	HACK0920

TAPE(8) = WTAIL	HACK0930
TAPE(9) = RLL	HACK0940
TAPE(10) = ALL	HACK0950
TAPE(11) = VLL	HACK0960
TAPE(12) = CEP	HACK0970
TAPE(13) = PLMASS	HACK0980
TAPE(14) = PLLT	HACK0990
TAPE(15) = RANGE	HACK1000
TAPE(16) = FORCE	HACK1010
TAPE(17) = SUSL	HACK1020
TAPE(18) = SUSL	HACK1030
TAPE(19) = RFLIB	HACK1040
TAPE(20) = WPROPS	HACK1050
TAPE(21) = RDOO	HACK1060
TAPE(22) = RDOO	HACK1070
TAPE(23) = WPROPB	HACK1080
TAPE(24) = XLTOT	HACK1090
TAPE(25) = WTH1	HACK1100
TAPE(26) = WTH2	HACK1110
TAPE(27) = WM	HACK1120
TAPE(28) = XLM	HACK1130
TAPE(29) = WP	HACK1140
TAPE(30) = DEXIT	HACK1150
TAPE(31) = WINERT	HACK1160
TAPE(32) = PMF	HACK1170
TAPE(33) = WM	HACK1180
TAPE(34) = WPOVWD	HACK1190
TAPE(35) = XLPS	HACK1200
TAPE(36) = WPROPI	HACK1210
TAPE(37) = XLTF	HACK1220
TAPE(38) = WF	HACK1230
TAPE(39) = XLTOX	HACK1240
TAPE(40) = WDX	HACK1250
TAPE(41) = WFTANK	HACK1260
TAPE(42) = WXTNK	HACK1270
TAPE(43) = XLTP	HACK1280
TAPE(44) = WTP	HACK1290
TAPE(45) = ACA3	HACK1300
TAPE(46) = PC	HACK1310
TAPE(47) = WTSP	HACK1320
TAPE(48) = A5A3	HACK1330
TAPE(49) = WC	HACK1340
TAPE(50) = WFMR	HACK1350
TAPE(51) = A6A3	HACK1360
TAPE(52) = WTINI T	HACK1370
TAPE(53) = WTNOZ	HACK1380
TAPE(54) = AC	HACK1390
TAPE(55) = XLF	HACK1400
TAPE(56) = CDO	HACK1410
TAPE(57) = CLA	HACK1420
ILU = 60	HACK1430
DO 677 I = 1, 13	HACK1440
677 TAPE(ILU+I) = COSDUM(I)	HACK1450
TAPE(100)=COSTX	HACK1460
666 CONTINUE	HACK1470

TAPE(81) = RVIX(1,I1)	HACK1480
TAPE(82) = RVIX(2,I2)	HACK1490
TAPE(83) = RVIX(3,I3)	HACK1500
TAPE(84) = RVIX(4,I4)	HACK1510
TAPE(85) = RVIX(5,I5)	HACK1520
TAPE(86) = RVIX(6,I6)	HACK1530
TAPE(87) = RVIX(7,I7)	HACK1540
TAPE(88) = RVIX(8,I8)	HACK1550
TAPE(89) = RVIX(9,I9)	HACK1560
TAPE(90) = RVIX(10,I10)	HACK1570
TAPE(91) = RVIX(11,I11)	HACK1580
TAPE(92) = RVIX(12,I12)	HACK1590
TAPE(93) = RVIX(17,I17)	HACK1600
TAPE(94) = RVIX(13,I13)	HACK1610
TAPE(95) = RVIX(14,I14)	HACK1620
TAPE(96) = RVIX(15,I15)	HACK1630
TAPE(97) = RVIX(16,I16)	HACK1640
IF (NCONOT .EQ. -47) GO TO 777	HACK1650
IF (KFIL12 .GT. 0) GO TO 8497	HACK1660
C LOAD CONCEPT ON FILE 12 FOR SCREENING	HACK1670
JD12 = NCONFG	HACK1680
IF (NCONFG .GT. KSAVEL) GO TO 1393	HACK1690
WRITE (N12,JD12) TAPE	HACK1700
ND12 = JD12 - 1	HACK1710
1393 CONTINUE	HACK1720
8497 CONTINUE	HACK1730
6007 FORMAT (5X5HTAPE* (10X, 5G15.8))	HACK1740
GO TO 6999	HACK1750
6000 CONTINUE	HACK1760
JD12 = NCONOT	HACK1770
READ(N12,JD12) TAPE	HACK1780
NCONFG = TAPE(1)	HACK1790
WTH1 = TAPE(25)	HACK1800
WTH2 = TAPE(26)	HACK1810
WORTH = (WTH1*WTM1 + WTH2*WTM2) / (WTM1 + WTM2)	HACK1820
6999 CONTINUE	HACK1830
IF (IX .EQ. 0) GO TO 7198	HACK1831
IF (NCONOT .EQ. 0) CALL PAGE	HACK1840
WRITE (N6,3711) NCONFG	HACK1850
3711 FORMAT(12X,6H*****/ 2X,10HCONCEPT *, 15, 7H * COMP,6X,5HWT.L ⁹ ,	HACK1860
1 5X,5HLT.IN,3X,30HPHASE RANGE.NM ALT.FT VEL.M /	HACK1870
2 12X,6H*****,3X,2H**,8X,3H***,7X3H***,6X3H***,3X3H*** ,	HACK1880
3 8X,3H***, 4X3H***)	HACK1890
WRITE(N6,3712) TAPE(100), (TAPE(I),I=3,6)	HACK1900
3712 FORMAT(2X,5HCOST*,F10.2,3X,4HWING,F10.0,13X,6HCRUISE,FR.1,	HACK1910
1 F9.0, F7.2)	HACK1920
WRITE (N6,3713) (TAPE(I),I=7,11)	HACK1930
3713 FORMAT(2X5HWORTH,F10.2,3X4HTAIL,F10.0,15X4HLLRI,F8.1,	HACK1940
1 F9.0, F7.2)	HACK1950
WRITE (N6,3714) (TAPE(I),I=12,15)	HACK1960
3714 FORMAT(2X3HCEP,F12.2,3X3HPLC,F11.0,F10.0,4X5HTOTAL,FR.1)	HACK1970
WRITE (N6,3715) (TAPE(I),I=16,18)	HACK1980
3715 FORMAT(2X,5HFORCE,F10.0, 3X,5HSUST., F9.0,F10.0)	HACK1990
WRITE (N6,3716) (TAPE(I),I=19,20)	HACK2000
3716 FORMAT(2X,5HRELIR, F10.2,5X, 6HS.PROP, F10.0)	HACK2010

WRITE (N6,3717) (TAPE(I),I=21,23), TAPE(2), TAPE(24)	HACK2020
3717 FORMAT(20X, 7HBOOSTER, F7.0, F10.0 / 22X,6HB.PROP, F10.0 /	HACK2030
1 20X,5HTOTAL, F9.0, F10.0)	HACK2040
WRITE(N6,7777) TAPE(62), (TAPE(I), I=64,68), TAPE(63),	HACK2051
1 (TAPE(I), I=69,73)	HACK2052
7777 FORMAT(// 9X14H*COST SUMMARY* / 24X5HTOTAL,5X4HAF+I,	HACK2053
1 6X4HPROP, 6X4HGUID, 6X4HCONT, 6X3HW/H /	HACK2054
2 5X6HF.U.P.,4X,6F10.3 / 9X5HRDT+F, 5X,6F10.3)	HACK2055
777 CONTINUE	HACK2050
IF (KIND .GT. 49) GO TO 5450	HACK2060
WRITE (N6, 3019)	HACK2070
3019 FORMAT (///)	HACK2080
WRITE (N6, 3027)	HACK2090
3027 FORMAT (6X,20HBASIC VARIABLES LIST /)	HACK2100
IF (KIND .GE. 39) WRITE (N6, 3042)	HACK2110
3042 FORMAT(6X4HWING,3X4HTAIL,14H W.A.R L.P/L,2X5HW.W/H,2X5HW.G/C,	HACK2120
1 3X4HDIAM,2X,5HR.T/W,2X,7HD.P.ALT,2X5HD.P.M,2X6HC.P.GM,	HACK2130
2 2X5HD.TT4,2X6HW.OR.L,1X7HD.P.FCN,1X7HD.P.NAC,1X7HD.P.TAC,	HACK2140
3 1X7HD.P.PMG)	HACK2150
IF (KIND .LT. 39) WRITE (N6, 3052)	HACK2160
3052 FORMAT(6X4HWING,3X4HTAIL,14H W.A.R L.P/L,2X5HW.W/H,2X5HW.G/C,	HACK2170
1 3X4HDIAM,2X,5HR.T/W,2X,7HF.PARAM,2X5HS.ISP,2X6HC.PRES,	HACK2180
2 2X,5HMIX.R,2X,6HW.OR.L)	HACK2190
IF (KIND .GT. 39) GO TO 3032	HACK2200
C LIQ/SOL CASE WITH ITHR=0 FOR F INPUT	HACK2210
IF (ITHR .EQ. 0) WRITE (N6,3062) (TAPE(I),I=81,93)	HACK2220
3062 FORMAT(3X, 3F7.2, F7.1, 2F7.0,F7.1,F7.2, F9.0 ,F7.1,F8.0,	HACK2230
1 F7.2, F8.0)	HACK2240
IF (ITHR .NE. 0) WRITE (N6,3082) (TAPE(I),I=81,93)	HACK2250
3082 FORMAT(3X, 3F7.2, F7.1, 2F7.0,F7.1,F7.2, F9.0 ,F7.1,F8.0,	HACK2260
1 F7.0, F8.0)	HACK2270
GO TO 3092	HACK2280
3032 CONTINUE	HACK2290
C RAMJET CASE	HACK2300
WRITE(N6,3072) (TAPE(I),I=81,97)	HACK2310
3072 FORMAT(3X, 3F7.2, F7.1, 2F7.0,F7.1,F7.2, F9.2 ,F7.1,F8.0,	HACK2320
1 F7.0, F8.0, 4F8.2)	HACK2330
3052 CONTINUE	HACK2340
WRITE (N6,3018)	HACK2350
3018 FORMAT(//)	HACK2360
IF (NCONOT .EQ. -47) GO TO 5450	HACK2370
IF (KIND .GT. 29) GO TO 5440	HACK2380
IF (KIND .GT. 19) GO TO 5420	HACK2390
C FOR SOLID	HACK2400
WRITE (N6,5461) (TAPE(I),I=27,34)	HACK2410
5461 FORMAT(6X6PWT.MTR,F13.0, 5X6HLT.MTR,F9.0 /	HACK2420
1 6X7HWT.PROP, F12.0, 5X6HEXIT.D, F9.2 /	HACK2430
2 6X7HWT.INRT,F12.0, 5X3HPWF, F12.2 /	HACK2440
3 6X6HWT.NOZ, F13.0, 5X6HMASS.R, F9.2)	HACK2450
GO TO 5450	HACK2460
5420 CONTINUE	HACK2470
C FOR LIQUID	HACK2480
WRITE (N6,5471) (TAPE(I),I=35,40), TAPE(37), TAPE(41),	HACK2490
1 TAPE(39), (TAPE(I),I=42,44), TAPE(58)	HACK2500
5471 FORMAT(15X5FLT.IN,5X5HWT.LB / 6X3HENG,F11.0,F10.0 /	HACK2510

1	6X4HFUEL,2F10.0 / 6X2HDX, F12.0,F10.0 /	HACK2520
2	6X4HFTNK,2F10.0 / 6X4HDXTK, 2F10.0 / 6X4HTFMP,2F10.0 /	HACK2530
3	6X4HNDZL, 10X,F10.0)	HACK2540
	GO TO 5450	HACK2550
5440	CONTINUE	HACK2560
C	FOR PAMJET	HACK2570
	WRITE (N6,5481) (TAPE(I),I=45,50)	HACK2580
5481	FORMAT(6X,4HACA3, F10.4, 5X7HMT.INLT,F8.1, 5X6HWT.SPP,F11.1 /	HACK2590
1	6X,4HASA3,F10.4, 5X7HWI.INLT,F8.1, 5X6HWT.FMB,F11.1)	HACK2600
	WRITE (N6,5482) (TAPE(I),I=51,55)	HACK2610
5482	FORMAT(6X4HA6A3,F10.4, 5X7HWT.INLT,F8.1, 5X6HWT.NOZ,F11.1 /	HACK2620
1	6X6HC.AREA,F8.2, 5X7HLE.INLT,F8.1)	HACK2630
5450	CONTINUE	HACK2640
	NTEN = 10	HACK2650
	NKIND = MOD (KIND, NTEN)	HACK2660
	IF (KIND .EQ. 41) GO TO 7111	HACK2670
	IF (NKIND .NE. 3) GO TO 7188	HACK2680
	IF (FACTOR .GT. 1) GO TO 7107	HACK2690
	WRITE (6, 7112)	HACK2700
7112	FORMAT(6X 1PHSINGLE EXT BOOSTER)	HACK2710
	GO TO 7198	HACK2720
7107	CONTINUE	HACK2730
	WRITE (6, 7122)	HACK2740
7122	FORMAT (6X17HDUAL EXT BOOSTERS)	HACK2750
	GO TO 7198	HACK2760
7111	CONTINUE	HACK2770
	WRITE (6, 7132)	HACK2780
7132	FORMAT (6X 16HINTEGRAL BOOSTER)	HACK2790
	GO TO 7198	HACK2800
7188	CONTINUE	HACK2810
	WRITE (6,7142)	HACK2820
7142	FORMAT (6X 9HUNBOOSTED)	HACK2830
7198	CONTINUE	HACK2840
	RETURN	HACK2850
	END	HACK2860

SUBROUTINE COSTWT(COSN,WTTOT)	COST0010
IC = (WTTOT + 5.) / 10.	COST0020
COSN = IC	COST0030
COSN = COSN*10.	COST0040
RETURN	COST0050
END	COST0060

SUBROUTINE PACKER (KFAIL)	PACK0010
C NUK.CM-CGSM R.K.MCDONOUGH FIV/EBCD 10/18/73	PACK0020
INTEGER VTCODE	PACK0030
COMMON /AFTAR/ ARVT2(2), BVT, ARV11(11)	PACK0040
COMMON /CODEXX/ KIND, ITYPE, XYZ14(14)	PACK0050
COMMON /DRG/ DR36(36), NW, TCW,TCT, BT, BW, DR6(6)	PACK0060
COMMON /EXTERN/ AR20(20)	PACK0070
EQUIVALENCE (AR20(5),WVEH), (AR20(6), XLVEH), (AR20(3), DCASE)	PACK0080

COMMON /GOBCL/ DBOOST, WARD77(77)	PACK0090
COMMON/INDATX/HPROJ,HC,W,ZZ(5),HBLDIV,ZZZ(11),TSTART,ZZZZ(2)	PACK0100
COMMON /LFT/ XLF10(10), IART, XLF3(3)	PACK0110
COMMON /PRINTR/ IP4(4), IPACK, IP2(2)	PACK0120
COMMON /SUPERB/ KSYSA, KLNCH, KFGBV	PACK0130
COMMON /TUB/ BCLR,CLRA,CLRF,DEL VX,FCLR,GCLR,KMT,PSUB,	PACK0140
1 RATCLR, REF, THEAD, THEBST, TUBTHK, VTCCDE, WCLR,	PACK0150
2 WTMAX, XLTMAX,DTUBMX, XLBMX, DPYLCN	PACK0160
NAMELIST/BUG1/DENV,RENV,ADIM,BDIM,CDIM,DDIM,PHIP,SDIM,TDIM,UDIM,	PACK0170
1VDIM,THETRP,CDIMX,CDIMXX,KRUG	PACK0180
NAMELIST/BUG2/EDIM,FDIM,GDIM,PHI,GAMA,HDIM,PSI,CDIM,PDIM,THETZ,	PACK0190
17DIM,DFLDM,DFLDEL,DELVT,KOUNT,KBUG,RENV	PACK0200
NAMFLIST/BUG3/RDIM,THETBX,BDIMP,CDIMP,DDIMP,BDIMX,GDIMX,PSIB,XI,	PACK0210
1XJ,PSIRP,THETBZ,XK,XL,SDIMX,XM,XN,THETBY,PSIBX,XO,XP,KRUG	PACK0220
NAMELIST/BUG4/STUB,BEXP,WFOLD,RESW,PHIW,WDIM,IART,STUBHT,BEXP,	PACK0230
1HTFOLD,VTFOLD,VTLSTR,BETT, VTLUST,VTLST,VTLFLD,STUBVT,	PACK0240
2GAMX,XDIM,STUBT,BETX,ALPH,XDIMP,TFOLD,ALPHX,BETXX,XDIMU,STUBTU,	PACK0250
2TFOLDU,STUBTL,BETZX,GAMXZ,XDIML,TFOLDL,KBUG	PACK0260
NAMELIST/BUG6/ TUBID,TUBCD,XLHEAD,TUBLT,TURCYL	PACK0270
NAMELIST/BUG5/ KCNT,DTUBI,RENV	PACK0280
NAMFLIST/BUG7/WCLR,FCLR,DPYLON,GCLR,PSUB,KMT,ZS,ZI,ZT,ZTOT,BVT,	PACK0290
1HTOT,RT	PACK0300
NAMELIST/INPUT/ DBOOST,DCASE,BCLR,THEBST,DTUBX,DEL VX,RATCLR,	PACK0310
1 WTOT, HTOT, ITYPE, IART, NW, RW, BT, BVT, DELTUB, TUBTHK, REF,	PACK0320
2 CLRF, CLRA, THEAD,XLVEH,VTCCDE,WCLR,FCLR,DPYLON,GCLR,PSUB,	PACK0330
3 WTMAX, XLTMAX,KMT, KLNCH,WVEH,KIND	PACK0340
CTURX = 2. * DCASE	PACK0350
DELTUB = .05 * DTURX	PACK0360
IPSM = IPACK	PACK0370
KFAIL = 0	PACK0380
IF(IPSM.GT.0) WRITE(6, INPUT)	PACK0390
P1=3.14159	PACK0400
CPR=57.296	PACK0410
THETAB=THEBST/OPR	PACK0420
RBOOST=0.5*DBOOST	PACK0430
DELVT=DEL VX	PACK0440
DTUBI=DTURX	PACK0450
KCNT=0	PACK0460
KOUNT=0	PACK0470
RCASE=0.5*DCASE	PACK0480
IF(ITYPE.EQ.1) GO TO 7849	PACK0490
C*****SIDE MOUNTED INLETS*****	PACK0500
WTOT=HBLDIV + W + 2.* TSTART	PACK0510
HTOT=HC + HPROJ + 2.* TSTART	PACK0520
GO TO 7850	PACK0530
C*****PELTY MOUNTED INLETS*****	PACK0540
7849 WTOT=W + 2.* TSTART	PACK0550
HTOT=HBLDIV + HC + HPROJ + 2.* TSTART	PACK0560
7850 CONTINUE	PACK0570
K10=10	PACK0580
IF(MOD(KIND,K10) .LT. 3) RBOOST=0.0	PACK0590
IF(KIND.LE.20) HTOT=C.0	PACK0600
IF(KIND.LE.20) WTOT=0.0	PACK0610
IF(KLNCH.EQ.1) GO TO 120	PACK0620
15 DENV=DTUBI-2.0*RATCLR	PACK0630

PENV=0.5*DFNV	PACK0640
20 IF((PCASE + DELVT).EQ.RENV)GO TO 70	PACK0650
ADIM=RENV-PCASE-DELVT	PACK0660
IF((DELVT + RCASE).GT.RENV) ADIM=DELVT+RCASE-RENV	PACK0670
BDIM=RCASE + RBOOST + BCLR	PACK0680
CDIM=SQRT(ADIM**2 + BDIM**2 - 2.0*ADIM*BDIM*COS(THETAR))	PACK0690
DDIM=CDIM + RBOOST	PACK0700
IF(DDIM.GT.RENV) GO TO 1000	PACK0710
IF(ITYPE.FO.2)GO TO 900	PACK0720
C****PELTY MOUNTED INLETS	PACK0730
IF((HTOT + RCASE + DELVT).GT.DENV) GO TO 2000	PACK0740
PHIP=ATAN(0.5*WTOT/(HTOT + RCASE))	PACK0750
SDIM=SQRT(0.25*WTOT**2 + (HTOT + RCASE)**2)	PACK0760
TDIM=SQRT(ADIM**2 + SDIM**2 - 2.0*ADIM*SDIM*COS(PHIP))	PACK0770
IF(TDIM.GT.PENV) GO TO 2000	PACK0780
UDIM=RBOOST + 0.5*WTOT + 1.0	PACK0790
VDIM= BDIM*SIN(THETAR)	PACK0800
IF(UDIM.GT.VDIM) GO TO 50	PACK0810
KPUG=1	PACK0820
IF(IPSM.GT.C) WRITE(6,BUG1)	PACK0830
GO TO 60	PACK0840
50 VDIM=UDIM	PACK0850
KPUG=2	PACK0860
THETRP=AR SIN(VDIM/BDIM)	PACK0870
CDIMX=SQRT(ADIM**2 + BDIM**2 - 2.0*ADIM*BDIM*COS(THETRP))	PACK0880
CDIMXX=CDIMX + RBOOST	PACK0890
KPUG=3	PACK0900
IF(IPSM.GT.C) WRITE(6,BUG1)	PACK0910
IF(CDIMXX.GT.RENV) GO TO 3000	PACK0920
GO TO 60	PACK0930
C****TWO-INLET CONFIGURATIONS***	PACK0940
500 EDIM=0.5*HTOT	PACK0950
GDIM=RCASE + WTOT	PACK0960
GDIM=SQRT(EDIM**2 + EDIM**2)	PACK0970
PHI=ATAN(EDIM/EDIM)	PACK0980
GAMA=0.5*PI + PHI	PACK0990
HDIM=SQRT(ADIM**2 + GDIM**2 - 2.0*ADIM*GDIM*COS(GAMA))	PACK1000
IF((HDIM-RENV).GT.0.25) GO TO 920	PACK1010
PSI=0.5*PI - THETAR	PACK1020
CDIM=BDIM*SIN(PSI)	PACK1030
PDIM=EDIM + RBOOST + 1.0	PACK1040
KPUG=4	PACK1050
IF(IPSM.GT.C) WRITE(6,BUG2)	PACK1060
KPUG=5	PACK1070
IF(PDIM.GT.DDIM) GO TO 950	PACK1080
GO TO 60	PACK1090
920 DELT=HDIM - RENV	PACK1100
KPUG=4	PACK1110
DTURI=DTURI + DELT*2.0	PACK1120
KOUNT=KOUNT + 1	PACK1130
IF(IPSM.GT.C) WRITE(6,BUG2)	PACK1140
IF(KOUNT.GT.10) GO TO 999	PACK1150
GO TO 15	PACK1160
950 PDIM=RBOOST + 0.5	PACK1170
THETRX=AR SIN(RDIM/BDIM)	PACK1180

IF (THETBX.GT.THETAB) GO TO 5000	PACK1190
RCIMP=BDIM + 1.0	PACK1200
CDIMP=SQRT(ADIM**2 + BDIM**2 - 2.0*ADIM*BDIM*COS(THETBX))	PACK1210
DDIMP=CDIMP + RBOOST	PACK1220
IF(CDIMP.GT.RENV) GO TO 6000	PACK1230
GO TO 60	PACK1240
C***CENTER LINE OF MISSILE ON CENTER LINE OF TUBE***	PACK1250
70 RCIMX=FCASE + RBOOST + RCLR	PACK1260
IF(RDIMX.GT.RENV) GO TO 1000	PACK1270
IF(ITYPE.EQ.1) GO TO 80	PACK1280
C****TWO INLET CONFIGURATIONS***	PACK1290
CCIMX=SQRT(EDIM**2 + FDIM**2)	PACK1300
IF(GDIMX.GT.RENV) GO TO 4000	PACK1310
PSIR=C.5*PI - THETAB	PACK1320
XI=BDIM*SIN(PSIB)	PACK1330
XJ=FDIM + RBOOST + 1	PACK1340
KPUG=6	PACK1350
IF(XJ.GT.XI) GO TO 75	PACK1360
GO TO 60	PACK1370
75 XI=XJ	PACK1380
KPUG=7	PACK1390
PSIRP=AR SIN(XI/BDIM)	PACK1400
THETBZ=C.5*PI-PSIRP	PACK1410
XK=BDIM*SIN(THETBZ)	PACK1420
XL=RBOOST + 0.5	PACK1430
IF(XL.GT.XK) GO TO 5000	PACK1440
GO TO 60	PACK1450
C****BELLY MOUNTED INLETS***	PACK1460
80 SDIMX=SQRT(0.25*WTOT**2 + (RCASE + HTOT)**2)	PACK1470
KPUG=8	PACK1480
IF(SDIMX.GT.RENV) GO TO 2000	PACK1490
YM=RDIM*SIN(THETAP)	PACK1500
XN=RBOOST + 0.5*WTOT + 1.0	PACK1510
KPUG=9	PACK1520
IF(XN.GT.XM) GO TO 60	PACK1530
THETRY=AR SIN(XN/BDIM)	PACK1540
PSIRX=C.5*PI - THETRY	PACK1550
XC=RBOOST + 1.0	PACK1560
XP=RDIM*SIN(PSIRX)	PACK1570
IF(XP.GT.XC) GO TO 60	PACK1580
GO TO 7000	PACK1590
C***MISSILE + BOOSTER + INLETS WILL FIT INSIDE CAN ENVELOPE***	PACK1600
60 CONTINUE	PACK1610
IF(IPSM.GT.0) WRITE(6,17)	PACK1620
17 FORMAT(/10X,52HMISSILE + BOOSTER + INLETS FIT WITHIN TUBE ENVELOPE)	PACK1630
1)	PACK1640
IF(IPSM.GT.0) WRITE(6,BUG1)	PACK1650
IF(IPSM.GT.0) WRITE(6,BUG2)	PACK1660
IF(IPSM.GT.0) WRITE(6,BUG3)	PACK1670
IF(IPSM.GT.0) WRITE(6,BUG4)	PACK1680
IF(IPSM.GT.0) WRITE(6,BUG5)	PACK1690
TURID=DTUR I	PACK1700
IF(TUBID.GT.DTURMX) GO TO 9100	PACK1710
TUROD=DTUR I + TURTHK	PACK1720
XLHEAC=TUROD*0.5/PEH	PACK1730

TURLT=XLVEH + CLRF + CLRA + 2.0*THEAD	PACK1740
IF(TURLT.GT.XLTBMX) GO TO 9000	PACK1750
TURCYL=TURLT - 2.0*XLHEAD	PACK1760
IF(IPSM.GT.0) WRITE(6,BUG6)	PACK1770
IF(NW.NE.1) GO TO 90	PACK1780
IF(IPSM.GT.0) WRITE(6,BUG3)	PACK1790
STUR=SQRT(RENV**2 - ADIM**2) - RCASE	PACK1800
BEXP=BW/2.	PACK1810
WFOLD=PEXP-STUR	PACK1820
RESW=SQRT(WFOLD**2 + (STUR + RCASE)**2)	PACK1830
PHIW=0.5*PI - ARSIN(WFOLD/RESW)	PACK1840
WDIM=SQRT(ADIM**2 + RESW**2 - 2.0*ADIM*RESW*COS(PHIW))	PACK1850
IF(WDIM.GT.RENV) GO TO 8000	PACK1860
50 IF(IART.GT.1) GO TO 95	PACK1870
IF(IPSM.GT.0) WRITE(6,BUG3)	PACK1880
KRUG=10	PACK1890
STURHT=SQRT(RENV**2 - ADIM**2) - RCASE	PACK1900
PEXPH=BT/2.	PACK1910
HTFOLD=PEXPH - STURHT	PACK1920
IF(VTCCODE.GT.1) GO TO 100	PACK1930
VFOLD=BVT-DELVT	PACK1940
GO TO 95	PACK1950
100 VTLSTB=RENV-DELVT-RCASE-ADIM	PACK1960
IF((RCASE+DELVT).GT.RENV)VTLSTB=RENV-ADIM-RCASE	PACK1970
IF((RCASE+DELVT).EQ.RENV)VTLSTB=RENV-RCASE	PACK1980
VFOLD=PVT-VTLSTB	PACK1990
GO TO 113	PACK2000
55 IF(IART.GT.2) GO TO 105	PACK2010
KRUG=11	PACK2020
IF((RCASE + DELVT).EQ.RENV) ADIM=C.0	PACK2030
STURHT=SQRT(RENV**2-ADIM**2)-RCASE	PACK2040
HTFOLD=0.5*BT - STURHT	PACK2050
VTLUST=DELVT	PACK2060
VTLST=RENV - RCASE - DELVT	PACK2070
VTLFD= 0.5*BT - VTLST	PACK2080
VTLFD=0.5*BT - VTLUST	PACK2090
GO TO 113	PACK2100
105 IF(IART.GT.3) GO TO 110	PACK2110
KRUG=12	PACK2120
STURVT=DELVT	PACK2130
IF((RCASE + DELVT).GE.RENV) GO TO 106	PACK2140
BETT=AR SIN(ADIM/(RENV*SIN(PI/3.)))	PACK2150
CAMX=PI-BETT-PI/3.	PACK2160
XDIM=RENV*SIN(PI/3.)*SIN(BETT)	PACK2170
STUBT=0.5*BT - XDIM	PACK2180
GO TO 108	PACK2190
106 IF((RCASE + DELVT).EQ.RENV) GO TO 107	PACK2200
IF((RCASE + DELVT).GT.RENV) ADIM=DELVT + RCASE -RENV	PACK2210
BETX=AR SIN(ADIM*SIN(2.*PI/3.)/RENV)	PACK2220
ALPH=PI-BETX-2.0*PI/3.	PACK2230
XDIMP=ADIM*SIN(ALPH)/SIN(BETT)	PACK2240
STURT =0.5*BT-XDIMP	PACK2250
GO TO 108	PACK2260
107 STUBT=RENV-RCASE	PACK2270
108 TFOLD=0.5*BT- STURT	PACK2280

IF((RCASE + DELT).GE.RENV) GO TO 111	PACK2290
GO TO 113	PACK2300
110 ALPHX=ARSIN(ADIM*SIN(0.75*PI)/RENV)	PACK2310
KRUG=13	PACK2320
BETXX=0.25*PI - ALPHX	PACK2330
XDIMU=ADIM*SIN(BETXX)/SIN(ALPHX)	PACK2340
STURTU=XDIMU-RCASE	PACK2350
TFOLDU=0.5*BT - STURTU	PACK2360
GO TO 112	PACK2370
111 IF((RCASE + DELT).GT.RENV) GO TO 112	PACK2380
STURTU=RENV - RCASE	PACK2390
STURTL=STURTU	PACK2400
TFOLDU=0.5*BT - STURTU	PACK2410
TFOLDL=TFOLDU	PACK2420
GO TO 113	PACK2430
112 BETZX=ARSIN(ADIM*0.707/RENV)	PACK2440
GAMXZ=PI - BETZX - PI/4.	PACK2450
XDIML=RENV*SIN(GAMXZ)/0.707	PACK2460
STURTL=XDIML - RCASE	PACK2470
TFOLDL=0.5*BT - STURTL	PACK2480
113 CONTINUE	PACK2490
IF(IPSM.GT.0) WRITE(6,BUG4)	PACK2500
GO TO 8888	PACK2510
120 CONTINUE	PACK2520
C*****WCLR= WING HEIGHT ABOVE DECK - IN	PACK2530
C*****FCLR= FUSELAGE HEIGHT ABOVE DECK- IN	PACK2540
C*****PYLON DEPTH - IN	PACK2550
C*****MINIMUM GROUND CLEARANCE - IN	PACK2560
C*****PSUB= PERCENT SUBMERGENCE OF BELLY MOUNTED ASM - RSUB/RMISSILE	PACK2570
C*****KMT=1 BELLY MOUNTED, KMT=2 WING MOUNTED	PACK2580
C***** ITYPE=1 BELLY INLET, ITYPE=2 DUAL SIDE MOUNTED INLETS	PACK2590
ZS= (2.0 - PSUB)*0.5*DCASE	PACK2600
IF(KMT.GT.1) ZS= DPYLON + DCASE	PACK2610
ZI=HTOT	PACK2620
IF(ITYPE.GT.1) ZI=0.0	PACK2630
IF(IART.GT.1) GO TO 200	PACK2640
ZT=0.0	PACK2650
IF(VTCODE.GT.1) ZT=BVT	PACK2660
GO TO 500	PACK2670
200 IF(IART.GT.2) GO TO 300	PACK2680
ZT=0.5*BT	PACK2690
GO TO 500	PACK2700
300 IF(IART.GT.3) GO TO 400	PACK2710
ZT=0.25*BT	PACK2720
GO TO 500	PACK2730
400 ZT=0.3535*BT	PACK2740
500 IF(HTOT.GT.ZT) ZT=0.0	PACK2750
IF(ZT.GT.HTOT) ZI=0.0	PACK2760
ZTOT=ZS + ZI + ZT + GCLR	PACK2770
AGCLR1=FCLR-ZTOT	PACK2780
AGCLR2=WCLR - ZTOT	PACK2790
IF(KMT.GT.1) GO TO 600	PACK2800
IF(ZTOT.GT.FCLR) GO TO 8500	PACK2810
GO TO 700	PACK2820
600 IF(ZTOT.GT.WCLR) GO TO 8600	PACK2830

700	CONTINUE	PACK2840
	IF (IPSM.GT. 0) WRITE (6,BUG7)	PACK2850
	IF(WVEH.GT.WTMAX) GO TO 8700	PACK2860
	IF(XLVEH.GT.XLTMAX)GO TO 8800	PACK2870
	IF(IPSM.GT.0) WRITE(6, 5)	PACK2880
9	FORMAT(10X,30HASM EXTERNAL CARRIAGE POSSIBLE)	PACK2890
	GO TO 8888	PACK2900
8500	KFAIL=1	PACK2910
	IF(IPSM.GT.0) WRITE(6, 10) ZTOT,FCLR,AGCLR1	PACK2920
10	FORMAT(/10X,46HREILY MOUNTED ASM FAILS CLEARANCE TEST ZTOT = ,	PACK2930
	IF6.2,2H, ,5HFCLR=,F6.2,2H, ,19HACTUAL GROUND CLR.=,F6.2,4H IN.)	PACK2940
	GO TO 8888	PACK2950
8600	KFAIL=1	PACK2960
	IF(IPSM.GT.0) WRITE(6, 11) ZTOT,WCLR,AGCLR2	PACK2970
11	FORMAT(/10X,46HWING MOUNTED ASM FAILS CLEARANCE TEST ZTOT = ,	PACK2980
	IF6.2,2H, ,5HWCLR=,F6.2,2H, ,19HACTUAL GROUND CLR.=,F6.2,4H IN.)	PACK2990
	GO TO 8888	PACK3000
8700	KFAIL=1	PACK3010
	IF(IPSM.GT.0) WRITE(6, 12)	PACK3020
12	FORMAT(/10X,21HASM FAILS WEIGHT TEST)	PACK3030
	GO TO 8888	PACK3040
8800	KFAIL=1	PACK3050
	IF(IPSM.GT.0) WRITE(6, 13)	PACK3060
13	FORMAT(/10X,21HASM FAILS LENGTH TEST)	PACK3070
	GO TO 8888	PACK3080
1000	CONTINUE	PACK3090
	IF(IPSM.GT.0) WRITE(6, 1)	PACK3100
1	FORMAT(/10X,36HMISSILE + BOOSTER TOO LARGE FOR TUBE)	PACK3110
	GO TO 999	PACK3120
2000	CONTINUE	PACK3130
	IF(IPSM.GT.0) WRITE(6, 2)	PACK3140
2	FORMAT(/10X,48HMISSILE + RELLY MOUNTED INLET TOO LARGE FOR TUBE)	PACK3150
	GO TO 999	PACK3160
3000	CONTINUE	PACK3170
	IF(IPSM.GT.0) WRITE(6, 3)	PACK3180
3	FORMAT(/10X,49HMISSILE + B.M. INLET + BOOSTER TOO LARGE FOR TUBE)	PACK3190
	GO TO 999	PACK3200
4000	CONTINUE	PACK3210
	IF(IPSM.GT.0) WRITE(6, 4)	PACK3220
4	FORMAT(/10X,44HMISSILE + SIDE MTD. INLET TOO LARGE FOR TUBE)	PACK3230
	GO TO 999	PACK3240
5000	CONTINUE	PACK3250
	IF(IPSM.GT.0) WRITE(6, 5)	PACK3260
	GO TO 999	PACK3270
5	FORMAT(/10X,40HINSUFFICIENT CLEARANCE BETWEEN BOOSTERS)	PACK3280
6000	CONTINUE	PACK3290
	IF(IPSM.GT.0) WRITE(6, 6)	PACK3300
6	FORMAT(/10X,49HMISSILE + S.M. INLET + BOOSTER TOO LARGE FOR TUBE)	PACK3310
	GO TO 999	PACK3320
7000	CONTINUE	PACK3330
	IF(IPSM.GT.0) WRITE(6, 7)	PACK3340
7	FORMAT(/10X,30HBOOSTER INTERFERENCE WITH WING)	PACK3350
8000	CONTINUE	PACK3360
	IF(IPSM.GT.0) WRITE(6, 8)	PACK3370
8	FORMAT(/10X,34HWING FOLD WILL NOT FIT IN ENVELOPE)	PACK3380

GO TO 8888	PACK3390
9000 KFAIL=1	PACK3400
IF(IPSM.GT.0) WRITE(6, 14) TUBLT, XLTBMX	PACK3410
14 FORMAT(/10X,14HTUBE LENGTH = ,F6.2,43H IN., GREATER THAN INPUT MAX	PACK3420
IMUM LENGTH OF ,F6.2,4H IN.)	PACK3430
GO TO 8888	PACK3440
9100 KFAIL=1	PACK3450
IF(IPSM.GT.0) WRITE(6, 16) TURID, DTUB	PACK3460
16 FORMAT(/10X,12HTUBE I.D. = ,F5.2,41H IN., GREATER THAN INPUT MAX	PACK3470
IMUM I.D. OF ,F6.2,4H IN.)	PACK3480
GO TO 8888	PACK3490
999 CONTINUE	PACK3500
DTUBI=DTUBI + DELTUB	PACK3510
KCNT=KCNT + 1	PACK3520
IF(IPSM.GT.0) WRITE(6,BUG5)	PACK3530
IF(KCNT.GT.10) GO TO 8888	PACK3540
GO TO 15	PACK3550
8888 CONTINUE	PACK3560
RETURN	PACK3570
END	PACK3580

SUBROUTINE SURF(SEI,ARI,ISURFI,IPLANI, BI,RCI,TCI,TANSI,TRI,IWT,	SURF0010
1 STEI)	SURF0020
REAL KDW,KVS,KRHT	SURF0030
COMMON /AERO/ X57(57), XDIT, X35(35), SLET, X12(12)	SURF0040
COMMON /AFTAR/ ARVT,TRVT,BVT,RCVT,TCVT,TANSVT	SURF0050
1 , STEVT, GGMIS(7)	SURF0060
COMMON /DPG/ DR36(36), NW, DR4(4), ART,ARW,TRT,TRW,DR2(2)	SURF0070
COMMON /LFT/ SFT10(10), IART, SFT3(3)	SURF0080
COMMON /NAERO/ TNZL,ST,STZL,THKRT, SW,THKRW,D1,TNZL11(11)	SURF0090
1 , WWING,IARW,TNZL5(5)	SURF0100
COMMON /PRINTR/ IZ3(4),IPACK, IZ33(2)	SURF0110
COMMON /SURFX/ RMDIS,WDC,GULT,IWTS,WWINGI,WTI,WQVAV,WQVAHT,	SURF0120
1 WQVAVT,WQVAT,WT,WHT,WVT,VTALOC,STAIL,SHTPAN,SHT,SVT,WTAILS	SURF0130
2 , SLEW,SLEVT,ISURFW,IPLANW,ISURFT,IPLANT	SURF0140
COMMON /UPINLT/ PRAMBL(129), XCGD1	SURF0150
COMMON /VERT/ VE18(18), THKRV, VE2(2)	SURF0160
COMMON /XINERT/ X26(45),PANWW, XX4(4),PANWHT, XXX4(4),PANWVT,	SURF0170
1 X61(61), PANWT, X14(14)	SURF0180
NAMLIST/BUG/ BWTOT,SWTOT,SWINT,ARWTCT,TRWTOT,WDCGNZ,AWW,BWW,	SURF0190
1 CWW,DWW,EWW,FWW,WWING	SURF0200
NAMLIST/BUG1/ STINT,BTTCT,STTOT,ARTTOT,TRTTOT,WHTAIL,WDCGNZ	SURF0210
2 , RVTOT,SVTINT,COS4VT,SVTOT,ARVTOT,TRVTOT,AVT,BVTX,CVT,	SURF0220
3 CVT,EVT,FVT,GVT,HVT,WVT,WHTAIL	SURF0230
C ISURFI=1----TRAPEZOIDAL WING*****	SURF0240
C ISURFI,1----DELTA WING*****	SURF0250
C*****IPLANI=1----INPUT SEI,ARI,TRI *****	SURF0260
C*****IPLANI=2----INPUT SEI,ARI,L.F.SWEEP ****	SURF0270
C*****IPLANI=3----INPUT SEI,ARI,DES MACH NO *****	SURF0280
C*****IWTS=1----INPUT SURFACE WEIGHTS-----*****	SURF0290
C*****IWTS=2-----SURFACE WEIGHTS BASED ON WT/UNIT AREA -----*****	SURF0300
C*****IWTS=3-----COMPUTE WEIGHTS BASED ON REF----- *****	SURF0310
IAIR=IPACK	SURF0320

CCASE = D1	SURF0330
IF(ISURFI.GT.1) GO TO 100	SURF0340
IF(IPLANI.GT.1) GO TO 110	SURF0350
PI=SQRT(SEI*ARI)	SURF0360
RCI=SEI/(0.5*BI)/(1.0 + TRI)	SURF0370
TCI=RCI*TRI	SURF0380
TANSI=4.*(1.-TRI)/((1.+TRI)*ARI)	SURF0390
GO TO 500	SURF0400
100 CONTINUE	SURF0410
IF(IPLANI.GT.1) GO TO 200	SURF0420
TRI=0.0	SURF0430
TANSI=4.0/ARI	SURF0440
BI=SQRT(SEI*ARI)	SURF0450
RCI=2.0*SEI/BI	SURF0460
TCI=RCI*TRI	SURF0470
GO TO 500	SURF0480
200 CONTINUE	SURF0490
IF(IPLANI.GT.2) GO TO 300	SURF0500
BI=SQRT(SEI*ARI)	SURF0510
RCI=2.0*SEI/BI	SURF0520
TCI=RCI*TRI	SURF0530
GO TO 500	SURF0540
300 IF(IPLANI .GT. 3) GO TO 3505	SURF0550
TANSI=SQRT(ABS(RMDES**2-1.))	SURF0560
BI=SQRT(SEI*ARI)	SURF0570
RCI=2.0*SEI/BI	SURF0580
TCI=RCI*TRI	SURF0590
GO TO 500	SURF0600
3505 PI = SQRT(SEI * ARI)	SURF0610
RCI = 2. * SEI / BI	SURF0620
TCI = RCI * TRI	SURF0630
SLEI = ATAN (2.*(RCI+.5*BI*TAN(SEI/57.296) - TCI)/BI)	SURF0640
TANSI = TAN (SLEI)	SURF0650
SLEI = SLEI * 57.296	SURF0660
GO TO 500	SURF0670
110 CONTINUE	SURF0680
IF(IPLANI.GT.2) GO TO 120	SURF0690
PI=SQRT(SEI*ARI)	SURF0700
CONI=TANSI*ARI*0.25	SURF0710
IF(CONI.GT.1.0) GO TO 130	SURF0720
TRI=(1.0-CONI)/(1.0 + CONI)	SURF0730
BI=SQRT(SEI*ARI)	SURF0740
RCI=SEI/(0.5*BI)/(1.0+TRI)	SURF0750
TCI=RCI*TRI	SURF0760
GO TO 500	SURF0770
120 IF (IPLANI .GT. 3) GO TO 3600	SURF0780
TANSI=SQRT(ABS(RMDES**2-1.))	SURF0790
CONI=TANSI*ARI*0.25	SURF0800
IF(CONI.GT.1.0) GO TO 130	SURF0810
TRI=(1.0-CONI)/(1.0+CONI)	SURF0820
BI=SQRT(SEI*ARI)	SURF0830
RCI=SEI/(0.5*BI)/(1.0+TRI)	SURF0840
TCI=RCI*TRI	SURF0850
GO TO 500	SURF0860
130 CONTINUE	SURF0870

ISURFI=3.0	SURF0880
TPI=0.0	SURF0890
API=4.0/TANSI	SURF0900
RI=SQRT(SFI*ARI)	SURF0910
RCI=2.0*SEI/RI	SURF0920
TCI=TRI*RCI	SURF0930
GO TO 500	SURF0940
3600 BI = SQRT (SEI * ARI)	SURF0950
RCI = SEI / (.5*BI)/(1.+TRI)	SURF0960
TCI = RCI * TRI	SURF0970
SLEI = 2. * (RCI+.5*RI*TAN(STEI/57.296) - TCI) / BI	SURF0980
SLEI = ATAN (SLEI)	SURF0990
TANSI = TAN(SLEI)	SURF1000
SLEI = SLEI * 57.296	SURF1010
500 CONTINUE	SURF1020
IF(IWTS.EQ.1) GO TO 400	SURF1030
IF(IWTS.EQ.2) GO TO 450	SURF1040
IF(IWTS.EQ.4) GO TO 350	SURF1050
IF(IWT.GT.0) GO TO 700	SURF1060
IF(NW.EQ.0) GO TO 700	SURF1070
C *****COMPUTE SURFACE WEIGHTS BASED ON REF. *****	SURF1080
COS4I=1.0/(TANSI*SQRT((1.0/TANSI)**2 + 0.5625))	SURF1090
IF(TRI.EQ.0.0) KDW=0.768	SURF1100
IF(TPI.GT.0.0) KDW=1.0	SURF1110
KVS=1.0	SURF1120
IF(NW.EQ.0) GO TO 700	SURF1130
RWTOT= BI + D1	SURF1140
SWINT=0.5*RCI*D1 + 0.125*D1*TANSI*D1	SURF1150
SWTOT=SEI + 2.0*SWINT	SURF1160
ARWTOT=RWTOT**2/SWTOT	SURF1170
TRWTOT=TCI/(RCI + 0.5*D1*TANSI)	SURF1180
WDCNZ=WDG*GULT	SURF1190
AWW=SQRT(WDCNZ)	SURF1200
PWW=(SWTOT/144.):**0.622	SURF1210
CWW=ARWTOT**0.785	SURF1220
DWW=THKRW**(-0.40)	SURF1230
EWW=(1.0 + TRWTOT)**0.05	SURF1240
FWW=1.0/COS4I	SURF1250
WWING=0.0103*KDW*KVS*AWW*BWW*CWW*DWW*EWW*FWW	SURF1260
IF(IARW.EQ.4) WWING=2.*WWING	SURF1270
IF(IAIR.GT.0) WRITE(6,BUG)	SURF1280
GO TO 600	SURF1290
700 CONTINUE	SURF1300
WDCNZ=WDG*GULT	SURF1310
STINT=0.5*RCI*D1 + 0.125*D1*TANSI*D1	SURF1320
PTTOT=BI + D1	SURF1330
STTOT=SEI + 2.0*STINT	SURF1340
STTOTF=STTOT/144.	SURF1350
ARTTOT=PTTOT**2/STTOT	SURF1360
TRTTOT=TCI/(RCI + 0.5*D1*TANSI)	SURF1370
COS4I=1.0/(TANSI*SQRT((1.0/TANSI)**2 + 0.5625))	SURF1380
WBTAIL=4.049*STTOTF**0.789*(WDCNZ/1000.):**0.25/(1.0 + D1/BTTOT)**2	SURF1390
IF(IART.NE.1) GO TO 111	SURF1400
GO TO 112	SURF1410
111 CONTINUE	SURF1420

AD-A048 366

LTV AEROSPACE CORP DALLAS TEX VOUGHT SYSTEMS DIV
SEATIDE ANALYSIS PROCESS. VOLUME III E. CRUISE MISSILE - CONCEP--ETC(U)
FEB 75 R K MCDONOUGH
VSD-00.1636-VOL-3E-REV-A

F/G 15/7

DAAB09-72-C-0062

NL

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ADA048366



WTAILS=8.098*STTOTF**.789*(WDGNZ/1414.)**0.25/	SURF1430
1(1.0 + D1/BTTOT)**2	SURF1440
IF(IAIP.GT.0) WRITE(6,BUG1)	SURF1450
C*****WT=WEIGHT OF CRUCIFORM TAIL	SURF1460
GO TO 1000	SURF1470
112 CONTINUE	SURF1480
KRHT=1.00	SURF1490
RVTOT=RVT + .5 * D1	SURF1500
SVTINT = .5 * RCVT * D1 + .125 * D1 * TANSVT	SURF1510
COS4VT=1.0/(TANSVT*SQRT((1.0/TANSVT)**2+ 0.5625))	SURF1520
SVTTOT=SVT + SVTINT	SURF1530
ARVTOT=RVTOT**2/SVTTOT	SURF1540
TPVTOT=TCVT/(RCVT + 0.5*D1*TANSVT)	SURF1550
AVT=WDGNZ**C.324	SURF1560
RVTX=(SVTTOT/144.)**C.606	SURF1570
CVT=RMDES**0.404	SURF1580
ARMT=XDIT-XCGD1	SURF1590
IF(ARMT.LT.4.) ARMT=4.0	SURF1600
DVT=(ARMT*CCASE/12.)**(-.516)	SURF1610
EVT=ARVTOT**C.344	SURF1620
FVT=THKRV**(-C.250)	SURF1630
CVT=(1.0 + TRVTOT)**0.25	SURF1640
HVT=COS4VT**(-0.232)	SURF1650
WVT=0.597*KRHT*AVT*RVTX*CVT*DVT*EVT*FVT*GVT*HVT	SURF1660
WTAIIS=WVT + WHTAIL	SURF1670
IF(IAIR.GT.0) WRITE(6,BUG1)	SURF1680
1000 CONTINUE	SURF1690
GO TO 600	SURF1700
400 CONTINUE	SURF1710
C ***** COMPONENT WEIGHTS MUST BE INPUT *****	SURF1720
IF(IART.NE.1) GO TO 1110	SURF1730
WVT=VTALOC * WTI	SURF1740
WHT = WTI - WVT	SURF1750
WWING=WWINGI	SURF1760
IF(NW.EQ.0) WWING=0.0	SURF1770
WTAIIS=WHT + WVT	SURF1780
GO TO 600	SURF1790
1110 CONTINUE	SURF1800
C *****INSERT TAIL WEIGHT HERE *****	SURF1810
WTAIIS=WTI	SURF1820
WWING=WWINGI	SURF1830
IF(NW.EQ.0) WWING=0.0	SURF1840
GO TO 600	SURF1850
350 CONTINUE	SURF1860
IF(NW.EQ.0) GO TO 360	SURF1870
NWPAN=2.0	SURF1880
IF(IARW.EQ.4) NWPAN=4.	SURF1890
WWING=PANWW*NWPAN	SURF1900
360 CONTINUE	SURF1910
NTPAN=4.0	SURF1920
IF(IAPT.EQ.3) NTPAN=3.	SURF1930
IF(IART.EQ.1) NHTPAN=2.	SURF1940
IF(IART.EQ.1) NVTAN=1.	SURF1950
IF(IART.EQ.1) GO TO 380	SURF1960
WTAIIS=PANWT*NTPAN	SURF1970

GO TO 600	SURF1980
380 WTAILS=PANWVT*NVTPAN + PANWHT*NHTPAN	SURF1990
GO TO 600	SURF2000
450 CONTINUE	SURF2010
IF(NW.FQ.0) GO TO 205	SURF2020
WWING=WOVAW*SW/144.	SURF2030
205 CONTINUE	SURF2040
WWING=0.0	SURF2050
IF(IART.NE.1) GO TO 210	SURF2060
WHT=WOVAHT*SHT/144.	SURF2070
WVT=WOVAVT*SVT/144.	SURF2080
WTAILS=WHT + WVT	SURF2090
GO TO 600	SURF2100
210 WT=WOVAT*ST /144.	SURF2110
WTAILS=WT	SURF2120
600 CONTINUE	SURF2130
RETURN	SURF2140
END	SURF2150

SUBROUTINE WORTH (WTH1, WTH2, EMPTY)	WORT0010
C NUK.CM-CGSM R.K.MCDONOUGH FIV/ERCD 10/18/73	WORT0020
C COMPUTE RELATIVE WORTH -- SIDE 1 AND 2 FIRST	WORT0030
COMMON /SCRNNL/ NPTS(20),PARVNL(7,20),DWNL(7,20),DUMMY(50)	WORT0040
1 ,NSCOST,IDU4M4(4)	WORT0050
COMMON / SWORTH/ KBASE, WORTH1, WORTH2, NPAR, KPAR(20), PARV(20),	WORT0060
1 DERV1(20), DERV2(20)	WORT0070
DIMENSION PARDON (20)	WORT0080
COMMON /PERF/ KRY2(2),PE4(4),MOPT, NLPHAZ, NCPHAZ, NDPHAZ,	WORT0090
1 XMACHF(20), ALTF(20), GAMMAF(20), FVALUE(20), PE580(580)	WORT0100
COMMON/ROUND/PRNG(20),WORTZ,CEP,RANGE,RCR,ACR,VCR,	WORT0110
1 RLL,ALL,VLL, RUF14(14)	WORT0120
COMMON /ZWORTH/7X(10), FORCE, ZSX(10), RELIB, NLLRI, ZAX(9)	WORT0130
C COMPUTE PHASE VARIABLES FROM PHASE STORES	WORT0140
IF ((NCPHAZ.LE.0) .OR. (NCPHAZ.GT.NLPHAZ)) GO TO 3501	WORT0150
NC = NCPHAZ -1	WORT0160
VCR = XMACHF(NCPHAZ)	WORT0170
ACR = ALTF(NCPHAZ)	WORT0180
IF (NCPHAZ .EQ. 1) RCR = PRNG(1)	WORT0190
IF (NCPHAZ .NE. 1) RCP = PRNG(NCPHAZ) - PRNG(NC)	WORT0200
GO TO 3505	WORT0210
3501 CONTINUE	WORT0220
VCR = 0.	WORT0230
ACR = 0.	WORT0240
RCR = 0.	WORT0250
3505 CONTINUE	WORT0260
IF ((NLLRI.LE.0) .OR. (NLLRI.GT.NLPHAZ)) GO TO 3511	WORT0270
NL = NLLRI - 1	WORT0280
VLL = XMACHF(NLLRI)	WORT0290
ALL = ALTF (NLLRI)	WORT0300
IF (NLLRI .EQ. 1) RLL = PRNG(1)	WORT0310
IF (NLLRI .NE. 1) RLL = PRNG(NLLRI) - PRNG(NL)	WORT0320
GO TO 3515	WORT0330
3511 CONTINUE	WORT0340

ALL = 0.	WORT0350
VLL = 0.	WORT0360
RLL = 0.	WORT0370
3515 CONTINUE	WORT0380
RANGE = PRNG (NLPHAZ)	WORT0390
CONF = 6076.1155	WORT0400
RCR = PCR / CONF	WORT0410
RLL = PLL / CONF	WORT0420
RANGE = RANGE / CONF	WORT0430
DO 10 I = 1, 20	WORT0440
10 PARDON(I) = PARV(I)	WORT0450
PARDON (1) = CEP	WORT0460
PARDON(2) = RANGE	WORT0470
PARDON (3) = FORCE	WORT0480
PARDON(4) = RELR	WORT0490
PARDON(5) = EMPTY	WORT0500
PARDON(6) = RCR	WORT0510
PARDON(7) = RLL	WORT0520
PARDON(8) = ACR	WORT0530
PARDON(9) = ALL	WORT0540
PARDON(10) = VCR	WORT0550
PARDON(11) = VLL	WORT0560
WTH1 = WORTH1	WORT0570
WTH2 = WORTH2	WORT0580
NPAR = 11	WORT0590
DO 100 I = 1, NPAR	WORT0600
IF (NPTS(I) .LE. 0) GO TO 100	WORT0610
CALL SLU(NPTS(I),PARVNL(1,I),DWNL(1,I),PARDON(I),WTHD,ILC,THI)	WORT0620
WTH1 = WTH1 + WTHD	WORT0630
WTH2 = WTH2 + WTHD	WORT0640
100 CONTINUE	WORT0650
ZAX(8) = WTH1	WORT0660
ZAX(9) = WTH2	WORT0670
RETURN	WORT0680
END	WORT0690

SUBROUTINE PSM (IRT, IFLY)	PSM 0010
PGM=NUK.CMCGSM GGJ/RKM FIV/EBCD 9/10/73	PSM 0020
EXECUTIVE FOR PROPULSION SYSTEM SIZING	PSM 0030
COMMON /RESYET/ FACBES, WRODSX, RES13(13)	PSM 0040
COMMON /CODEXX/ ISIZ, IZAP(15)	PSM 0050
EQUIVALENCE (IZAP(2), ILW)	PSM 0060
COMMON /EXTERN/ AR(20)	PSM 0070
COMMON /GUPDL/ WARD(78)	PSM 0080
COMMON /INPTTJ/ FND,ALPDES,AMDES,T4DES,SKSTR,DIAM,WTTJ,	PSM 0090
1 PAYLT,RINP3(3), PAYWT,RINP5(5), WTSUR, WROOST, RIN55(5)	PSM 0100
COMMON /INSERT/ ZX17(17), TNOZR, ZX15(15)	PSM 0110
COMMON /NAMSOL/ CCAS, XE2(2), STGW, ZLTOT, WMILS,	PSM 0120
1 ZLPAY, ZWPAY, ZARSUR, SOL4(4)	PSM 0130
COMMON /PINT/ FHI,FLO,PINT28(28)	PSM 0140
COMMON /PRINTR/ IPSM, I76(6)	PSM 0150
COMMON /ROCKET/ ROC20(20), DCAL, ROC6(6), XLL, WTL,	PSM 0160
1 XLPIL, WARL, WPLL, ROC7(7)	PSM 0170

	COMMON /RJDAT/ ZX3(3), ZA6A3, ZX5(5)	PSM 0180
	COMMON /SAVL/ FLOS, FHIS, SVL5(5)	PSM 0190
	COMMON /SOLR/ SOL7(7), WPX	PSM 0200
	COMMON /TOVPER/ BOOWP, BISPV, BTHVAC, BEXIT, SUSWP, SEXIT, BCANTA, WTI,	PSM 0210
1	DROPST, DROPER, KIND, A5A3, A6A3, ACA3, D3,	PSM 0220
2	TVACMX, TVACMN, YISP(20), XTHR TL(20), EXTRA(15)	PSM 0230
	COMMON /TURBI/ WAFCD5, ALFTJ, TJALT, TJMACH, TJTHR, T4TJ, TUR3(3),	PSM 0240
1	A9, WFUEL, XTOTAL, XLPS, XLNOZ, TUR16(16)	PSM 0250
	COMMON /WATIN/ WAT9(9), TIT, WAT3(3)	PSM 0260
	EQUIVALENCE (SOL7(1), WTSOL)	PSM 0270
	EQUIVALENCE (AR(5), WTTOT)	PSM 0280
	EQUIVALENCE (AR(6), XLTOT)	PSM 0290
	EQUIVALENCE (EXTRA(14), XLPAY), (EXTRA(15), XLMSCL)	PSM 0300
1	, (EXTRA(13), TNOZS)	PSM 0310
	NAMLIST/PERFL/ IPERF, FREQ, XISPLO, XISPHI, WDOT	PSM 0320
1	, YISP, XTHR TL, FREQD, FHI, FLO, WPX	PSM 0330
	DIMENSION FREQ(20)	PSM 0340
C	**	PSM 0350
C	**	PSM 0360
	KFAIL=0	PSM 0370
	IFLY=0	PSM 0380
	DCASE = DCAS	PSM 0390
	WTOTSV = WTTOT	PSM 0400
	IEB = 0	PSM 0410
	WBOOST = 0.	PSM 0420
	WPOOSX = 0.	PSM 0430
	CPOPST=0.	PSM 0440
	DROPER=0.	PSM 0450
	IF ((ISIZ.GE.40) .AND. (ISIZ.LT.50)) GO TO 400	PSM 0460
	NTEN = 10	PSM 0470
	NKIND = MOD (KIND, NTEN)	PSM 0480
	IF (NKIND.NE. 3) GO TO 93	PSM 0490
	IF (ILW .LT. 2) GO TO 93	PSM 0500
	WTOTAL = WTTOT	PSM 0510
	IFB = 1	PSM 0520
	CALL REXFC (WTOTAL, WBOOST, XLBOC, IFLY)	PSM 0530
	IF (IFLY .GT. 0) GO TO 900	PSM 0540
C	CALL FOR EXTERNAL BOOSTERS	PSM 0550
93	CONTINUE	PSM 0560
	IF (ISIZ.LT. 19) GO TO 100	PSM 0570
	IF (ISIZ.LT. 29) GO TO 200	PSM 0580
	IF (ISIZ.LT. 39) GO TO 300	PSM 0590
	IF (ISIZ.LT. 59) GO TO 500	PSM 0600
	GO TO 900	PSM 0610
100	CONTINUE	PSM 0620
C	SIZE SOLID PROP SYS FOR CRUISE MISSILE CGSM	PSM 0630
	IPERF=0	PSM 0640
	FREQD=0.0	PSM 0650
	STGW = STGW - WBOOST	PSM 0660
C	SIZE SOLID ROCKET PROPULSION SYSTEM	PSM 0670
	CALL SOLROC(IPERF, FREQD, XISPLO, WDOT, IFLY)	PSM 0680
	SUSWP = WPX	PSM 0690
	WTSOL = SOL + WBOOST	PSM 0700
	WTTOT =	PSM 0710
	WTI =	PSM 0720

	TVACMX = FHI	PSM 0730
	TVACMN = FLD	PSM 0740
	GO TO 105	PSM 0750
200	CONTINUE	PSM 0760
C	SIZE LIQUID ROCKET PROPULSION SYSTEM	PSM 0770
C	PARAMETERS SET FOR SOLID & USED FOR LIQUID	PSM 0780
	CCAL = CCAS	PSM 0790
	XLL = ZLTOT	PSM 0800
	WTL = STGW	PSM 0810
	WTL = WTL - WBOOST	PSM 0820
	XIPLL = ZLPAY	PSM 0830
	WARL = ZARSUR	PSM 0840
	WPLL = ZWPAY	PSM 0850
	IPERF=0	PSM 0860
	FREQD=0.	PSM 0870
	CALL ROCLIQ(IPERF,FREQD,XISPLC,WDOT,KFAIL)	PSM 0880
	TRAP = 0.03	PSM 0890
	SUSWP = (1.0 - TRAP) * SUSWP	PSM 0900
	IFLY = KFAIL	PSM 0910
	WTTOT = WTI + WBOOST	PSM 0920
	TVACMX = FHI	PSM 0930
	TVACMN = FLD	PSM 0940
105	CONTINUE	PSM 0950
	IF (IFLY .GT. 0) GO TO 900	PSM 0960
C	GENERATE PERFORMANCE MAP FOR ROCKETS - - - ISP VS. THR.RAT	PSM 0970
C	THR.RAT IS (F - FMIN) / (FMIN - FMAX)	PSM 0980
C	RAT FROM 0 TO 1	PSM 0990
C	SET IN CONSTANTS FOR VPM & ADM	PSM 1000
	TNOZR = TNOZS	PSM 1010
	SFXIT = SFXIT / 144.	PSM 1020
	XLSOL = XLPAY + XLMSOL	PSM 1030
	XLTOT = XLSOL	PSM 1040
	DROPST = 0.	PSM 1050
	IPERF=1	PSM 1060
	TAX = TVACMX - TVACMN	PSM 1070
	DTAX = TAX / 19.	PSM 1080
	FREQ(1) = TVACMN	PSM 1090
	FREQ(20) = TVACMX	PSM 1100
	FPE = TVACMN	PSM 1110
	XTHRTL(1)=0.	PSM 1120
	XTHRTL(20)=1.	PSM 1130
	DO 110 I = 2, 19	PSM 1140
	FPE = FRE + DTAX	PSM 1150
	FREQ (I) = FRE	PSM 1160
	XTHRTL(I) = (FRE - TVACMN) / TAX	PSM 1170
110	CONTINUE	PSM 1180
	IF (IPSM .NE. 0) CALL PAGE	PSM 1190
	DO 120 I = 1, 20	PSM 1200
	FREQD=FREQ(I)	PSM 1210
	IF (ISIZ .GT. 19) GO TO 114	PSM 1220
	CALL SOLROC(IPERF,FREQD, XISPLC,WDOT, KFAIL)	PSM 1230
	YISP(I) = PINT28(13)	PSM 1240
	GO TO 116	PSM 1250
114	CONTINUE	PSM 1260
	CALL ROCLIQ(IPERF,FREQD, XISPLO,WDOT,KFAIL)	PSM 1270

	YISP(1) = XISPLO	PSM 1280
116	CONTINUE	PSM 1290
120	CONTINUE	PSM 1300
	IFLY = KFAIL	PSM 1310
	IF (IPSM .GT. 0) WRITE(6,PERFL)	PSM 1320
	GO TO 900	PSM 1330
300	CONTINUE	PSM 1340
C	COMBINED CYCLE	PSM 1350
	GO TO 900	PSM 1360
400	CONTINUE	PSM 1370
C	RAMJET (EXT 800, INT 800, UN800)	PSM 1380
	IF (IRT .GT. 0) RETURN	PSM 1390
C	**	PSM 1400
C		PSM 1410
	CANT = WARD(17)	PSM 1420
	CALL PROPX (IFLY)	PSM 1430
	WARD(17) = CANT	PSM 1440
	WTI = WTTOT	PSM 1450
C		PSM 1460
C	**	PSM 1470
	GO TO 900	PSM 1480
500	CONTINUE	PSM 1490
C	DESIGN AND SIZE TURBOJET PROPULSION SYSTEM	PSM 1500
	FND= TJTHR	PSM 1510
	ALPDES = ALFTJ	PSM 1520
	AMDES = TJMACH	PSM 1530
	T4DES = T4TJ	PSM 1540
	TIT = T4TJ	PSM 1550
	CIAM = CCASE	PSM 1560
	WTTJ = WTTOT	PSM 1570
	WTTJ = WTTJ - WBOOST	PSM 1580
	PAYLT = ZLPAY	PSM 1590
	PAYWT = ZWPAY	PSM 1600
	WTSUR = ZARSUR	PSM 1610
	CALL TURBO (IFLY)	PSM 1620
	ZA6A3 = A9 / AR(12)	PSM 1630
	TNOZP = XLNOZ	PSM 1640
	SFXIT = A9	PSM 1650
	XLTOT = XTOTAL	PSM 1660
	SUSWP = WFUEL	PSM 1670
	WTI = WTTOT	PSM 1680
900	CONTINUE	PSM 1690
	IF(IEB.EQ.1) STGW = WTOTSV	PSM 1700
	IF(IEB.EQ.1) WTL = WTOTSV	PSM 1710
	IF(IEB.EQ.1) WTTJ = WTOTSV	PSM 1720
	IF (NKIND .NE. 3) REXIT = SEXIT	PSM 1730
	RETURN	PSM 1740
	END	PSM 1750
	SUBROUTINE SOLROC(IPERF, FREQ, XISPX, WDOT, KFAIL)	SOLR0010
C	NUK.CM-CGSM R.K.MCDONOUGH FIV/EBOD 10/18/73	SOLR0020
	COMMON /SOLMIS/ CSTAR1, CSTAR2, ETAISP, DUM7(7)	SOLR0030
	COMMON /CONLY/ KPIST, DIAFRZ, WMC, DTHRT, RNOZI, WMX, SOMMOR(4)	SOLR0040

COMMON /COMVLS/ COM(51)	SOLR0050
EQUIVALENCE (COM(47),WPX),	SOLR0060
5 (COM(48),DP),	SOLR0070
6 (COM(49),WNX)	SOLR0080
DIMENSION TABPRG(12)	SOLR0090
COMMON/NAMSQL/ DCASE, XI SPHJ,EPHJ, STGW,XTOTAL,	SOLR0100
1 WMISC,XLPAY, WPAY,WASURF,TOWDES,TRATIO,	SOLR0110
1 ITHR,FDES	SOLR0120
COMMON/PRINTR/ IPSM,IZ6(6)	SOLR0130
COMMON/COEXX/ZQ(2),ISIZ,ZAP(13)	SOLR0140
COMMON/COMP/TAREPS(505)	SOLR0150
NAMLIST/TOWPR/ ICOUNT, KCOUNT, FHI, FLC, TOWERR	SOLR0160
NAMLIST/WINUT/ TERMP,TERMQ,TERMR,TERMS,TERMT,XLC,WSC,WIC,WPC,	SOLR0170
1WC,WI,WP,WM,WN,WAH,WC,WFH,WMISC,XLM	SOLR0180
NAMLIST/PINNOZ/PCHI, PCLO, EPHI, EPLO,CSTARH,CSTARL, CFDELL,	SOLR0190
1CFDELL,ATHI,ATLO,CFTLO,TARAT	SOLR0200
DIMENSION X(3),NINV(3),PCLO(10)	SOLR0210
COMMON /TOVPR/ ZXX5(5), SEXIT, XX66(66)	SOLR0220
EQUIVALENCE (XX66(66), XLM)	SOLR0230
COMMON/SOLR/ WVEH, WM, XIROLL, XIPTCH, XCGMBX, XCGLAX, DEXIT, WP	SOLR0240
COMMON /SOLSAV/ PMF, WPOVWR, WN, WINEFT	SOLR0250
COMMON/SOLSV/ FLOS,FHIS,PCHIS, SISPLO, SISPHI, FPHIS, CSTRHS,	SOLR0260
1 CFDLLS, CFDLFS, ATHIS, DEXITS	SOLR0270
COMMON/PINT/	SOLR0280
1 FHI ,FLO ,XISPHI ,PCHI ,ETACF ,EXPBR ,PHINC7 ,	SOLR0290
2 PBELL ,RHOMTL ,RHOMTL ,SIGMTL ,REFH ,APAT ,RHGP ,	SOLR0300
3 XISPLD	SOLR0310
4 ,PHOINS, ATAT, TIC, REAH, PS, ZUMW10(10)	SOLR0320
COMMON/PINSOL/TABISP(719)	SOLR0330
COMMON/TABSET/ NMP,NPC,NISP,NMRP,NPCP,NEXR	SOLR0340
NAMLIST/INPUT/ DCASE, XI SPHJ,EPHJ,PCHI,STGW,XTOTAL,	SOLR0350
1 WMISC,XLPAY,ISIZ,ETACF,EXPBR,WPAY,WASURF,TOWDES,TRATIO,	SOLR0360
2 ITHR, FDES	SOLR0370
NAMLIST/NOZL/ DTHRT,DEXIT,PHINOZ,XL1,XL2,XL3,TIAHM,RNCZI,	SOLR0380
1ANDZI,CONRAT,XL4,XLNOZ	SOLR0390
NAMLIST/PINTL/ WNSA, WNCB, WNT, WNEC, WNSC, WPIN, WHS, WN	SOLR0400
NAMLIST/DGG/ TWC,WFS,XLNS,DELS,WAS,AP,TERMG,TERMH,TERMI,WPFH,	SOLR0410
1RZERO,AZERO,RP,TERMJ,TERMK,TERML,TERMM,WPR,DELS,WPADR	SOLR0420
NAMLIST/CAT/ RONE,AONE,WPAHR,WPCR,TERMN,TERMD,WPAH,ISIZ,TERMP,	SOLR0430
1TERMD,TERMR,TERMS,TERMT,XLC,WSC,WIC,WPC,WC,WI,WP,WM	SOLR0440
NAMLIST/FWDAFT/TFH,XLFH,AIGN,TERMA,TERMB,WSFH,TIC,TIFH,TERMC,	SOLR0450
1WIFH,WRFH,WFH,REFH,REAH,XLAH,TAH,TERMD,TERME,WSAH,TIAH,TERME,	SOLR0460
2WRAH,WAH	SOLR0470
NAMLIST/CGPAV/ XLK, ZNSA, RT, ZNCS, ZNT, ZEC, ZPIN, ZHS, ZRFH,	SOLR0480
1 ZSFH, ZIFH, ZPFH1, ZPFH2, RPFH1, WPFH1, WPFH2, ZPFH, ZBAH,	SOLR0490
2 ZSAH, ZIAH, ZPAH, ZC, ZP, ZFS, ZAS, ZI, XMOME, XCGMBX, XCGLAX	SOLR0500
NAMLIST/CG/ WINERT,PMF,XCGMBD,XCGMLA,XMISC,XISPLC	SOLR0510
NAMLIST/XINPUT/XTOTAL,XLPAY,XLNS,XLAH,XLFH,XLM,WSC,WIC,WC,	SOLR0520
1WI,WPC,WP,WPAH,WPFH,WM,WN,WAH,WFH,WMISC	SOLR0530
NAMLIST/XMOI/ STGLD,RGPOVL,RGP,XIPTCH,RGROVD,RGR,XIROLL	SOLR0540
DATA TABPRG/ 0.50, 0.56, 1.0, 0.375, 1.5, 0.325,	SOLR0550
1 2.00, 0.31, 3.0, 0.300, 20., 0.290/	SOLR0560
CSTAR(X) = 37.*ALOG(X) + 4946.	SOLR0570
PRAT(X) = X*1.15*EXP(0.0265*X)	SOLR0580
XX66(65) = XLPAY	SOLR0590

XISPHI=XISPHJ	SOLR0600
KCOUNT=0	SOLR0610
ICOUNT=0	SOLR0620
IF(IPSM.GT.C) WRITE(6,INPUT)	SOLR0630
WEST=0.32725*DCASE**3	SOLR0640
WVFH=STGW	SOLR0650
PI=3.14159	SOLR0660
FHI=TOWDES*WEST	SOLR0670
IF(ITHR.EQ.C) FHI=FDES	SOLR0680
FLO=FHI/TRATIO	SOLR0690
G=32.17	SOLR0700
IF(PCHI.GT.2000.C) PCHI=2000.0	SOLR0710
C*****FPHI=HIGH THRUST EXPANSION RATIO---TLU(XISPHI)	SOLR0720
DUM=1.0	SOLR0730
X(1)=DUM	SOLR0740
X(2)=PCHI	SOLR0750
X(3)=XISPHI	SOLR0760
NVAR=3	SOLR0770
NINV(1)=NMR	SOLR0780
NINV(2)=NPC	SOLR0790
NINV(3)=NISP	SOLR0800
CALL FASTS(NVAR,NINV,TABEPS(1),X,EPHI)	SOLR0810
CSTARH = CSTAR1 * ALOG(PCHI) + CSTAR2	SOLR0820
11 CFTHI=G*XISPHI/CSTARH	SOLR0830
CFDELH=ETACF*CFTHI	SOLR0840
12 CONTINUE	SOLR0850
IF(IPERF.EQ.0) GO TO 13	SOLR0860
IF(FREQ.LE.FLOS) GO TO 131	SOLR0870
IF(FREQ.GE.FHIS) GO TO 132	SOLR0880
FLO=FREQ	SOLR0890
FHI=FHIS	SOLR0900
PCHI=PCHIS	SOLR0910
ATHI=ATHIS	SOLR0920
DEXIT=DEXITS	SOLR0930
GO TO 13	SOLR0940
131 FLO=FLOS	SOLR0950
XISPLO=SISPLO	SOLR0960
XISPLO = XISPLO * ETAISP	SOLR0970
GO TO 985	SOLR0980
132 FHI=FHIS	SOLR0990
XISPHI=SISPHI	SOLR1000
XISPHI = XISPHI * ETAISP	SOLR1010
GO TO 986	SOLR1020
13 ATHI= FHI/(PCHI*CFDELH)	SOLR1030
PCRAT=PRAT(FHI/FLO)	SOLR1040
PCLO(1)=PCHI/PCRAT	SOLR1050
DO 102 I=2,10	SOLR1060
K=I-1	SOLR1070
TARAT=(PCHI/PCLO(K))**(1.-EXPBR)	SOLR1080
101 ATLO=ATHI*TARAT	SOLR1090
EPLO=EPHI/TARAT	SOLR1100
CTHRT=2.0*SQRT(ATLO/PI)	SOLR1110
IF(IPERF.FQ.1) GO TO 980	SOLR1120
DEXIT=CTHRT*SQRT(EPLO)	SOLR1130
SEXIT = .25 * PI * DEXIT**2	SOLR1140

IF(DEXIT-(DCASE-1.0).GT.0.1) GO TO 99	SOLR1150
GO TO 990	SOLR1160
99 CONTINUE	SOLR1170
DEXIT=DCASE-1.	SOLR1180
AREFN=0.7854*(DCASE-1.0)**2	SOLR1190
SEXIT = AREFN	SOLR1200
EPLD=AREFN/ATLO	SOLR1210
EPHI=AREFN/ATHI	SOLR1220
ICOUNT=ICOUNT + 1	SOLR1230
IF(ICOUNT.GT.10) RETURN	SOLR1240
IF (IPSM .GT. 0) WRITE(6,PINNOZ)	SOLR1250
DUM=1.0	SOLR1260
X(1)=DUM	SOLR1270
X(2)=PCHI	SOLR1280
X(3)=EPHI	SOLR1290
NVAR=2	SOLR1300
NINV(1)=NMRP	SOLR1310
NINV(2)=NPCP	SOLR1320
NINV(3)=NEXR	SOLR1330
CALL FASTS(NVAR,NINV,TABISP(1),X,XISPHI)	SOLR1340
GO TO 11	SOLR1350
980 CONTINUE	SOLR1360
DEXIT=DEXITS	SOLR1370
EPLD=DEXIT**2/DTHPT**2	SOLR1380
990 CONTINUE	SOLR1390
C*****XISPLO= LOW THRUST ISP---TLU(EPLD)	SOLR1400
DUM=1.0	SOLR1410
X(1)=DUM	SOLR1420
X(2)=PCLO(K)	SOLR1430
X(3)=EPLD	SOLR1440
NVAR=3	SOLR1450
NINV(1)=NMRP	SOLR1460
NINV(2)=NPCP	SOLR1470
NINV(3)=NEXR	SOLR1480
CALL FASTS(NVAR,NINV,TABISP(1),X,XISPLO)	SOLR1490
CSTARL = CSTAR1 * ALOG(PCLO(K)) + CSTAR2	SOLR1500
CFTLO=C*XISPLO/CSTARL	SOLR1510
CFDELL=ETACF*CFTLO	SOLR1520
PCLO(I)=FLO/(CFDELL*ATLO)	SOLR1530
IF (IPSM .GT. 0) WRITE(6,PINNOZ)	SOLR1540
IF(PCLO(I).LT.30.) GO TO 998	SOLR1550
IF(ABS(PCLO(I)-PCLO(K)).LT.10.) GO TO 103	SOLR1560
102 CONTINUE	SOLR1570
103 CONTINUE	SOLR1580
IF(IPERF.EQ.1) GO TO 987	SOLR1590
FLOS=FLO	SOLR1600
FHIS=FHI	SOLR1610
PCHIS=PCHI	SOLR1620
SISPLO=XISPLO	SOLR1630
SISPHI=XISPHI	SOLR1640
EPHIS=EPHI	SOLR1650
CSTRHS=CSTARL	SOLR1660
CFDELLS=CFDELL	SOLR1670
CFCLHS=CFDELLH	SOLR1680
ATHIS=ATHI	SOLR1690

DEXITS=DEXIT	SOLR1700
GO TO 104	SOLR1710
585 CONTINUE	SOLR1720
WCOT = FLO/XISPLO	SOLR1730
RETURN	SOLR1740
586 CONTINUE	SOLR1750
WCOT = FHI/XISPHI	SOLR1760
RETURN	SOLR1770
587 CONTINUE	SOLR1780
XISPLO = XISPLO * ETAISP	SOLR1790
WCOT = FREQ / XISPLO	SOLR1800
RETURN	SOLR1810
104 CONTINUE	SOLR1820
XL1= DTHRT*PEFLL*(SQRT(FPLO) -2.0 + COS(PHINOZ))/(200.*TAN(PHINOZ	SOLR1830
1))	SOLR1840
XL2= DTHRT*PEFLL*SIN(PHINOZ)/200.	SOLR1850
XL3=0.433*DTHRT	SOLR1860
TIAHM=1.26E-6*PCHI**0.8*(CSTARH/G)**1.7	SOLR1870
RNOZI=1.299*DTHRT + 0.5*TIAHM + 1.600	SOLR1880
ANOZI=PI*RNOZI*RNOZI	SOLR1890
AREFN=0.7854*(DCASE-1.0)**2	SOLR1900
IF(ANOZI.GT.AREFN) ANOZI=AREFN	SOLR1910
CONRAT=ANOZI/ATLO	SOLR1920
XL4=0.2887*DTHRT*(SQRT(CONRAT)-1.5)	SOLR1930
XLNOZ=XL1 + XL2 + XL3 + XL4	SOLR1940
IF(IPSM.GT.0) WRITE(6,NOZL)	SOLR1950
C**** COMPUTE NOZZLE WEIGHT	SOLR1960
WNSA=0.74*RHOMTL*ANOZI	SOLR1970
WNCS=(ANOZI-2.25*ATLO)*(RHOINS*TIAHM + 0.25*RHOMTL)	SOLR1980
WNT=0.0315*ATLO**1.5	SOLR1990
TRURNB=10.	SOLR2000
TRURNS=150.	SOLR2010
WNEC=(1.68E-8/SIN(PHINOZ))*RHOINS*ATLO*(EPLO-(2.-CCS(PHINOZ))**2)	SOLR2020
1*(CSTARH/G)**1.7*(PCHI**0.8*TRURNB + PCLO(I)**0.8*TRURNS)	SOLR2030
WNSC=(3.14E-5/SIN(PHINOZ))*RHOINS*ATLO**1.5*PCHI*	SOLR2040
1*(EPLO-(2.-COS(PHINOZ))**2)	SOLR2050
WPIN=0.068*PI*DTHRT**3	SOLR2060
WHS=EXP(0.588 + C.064*ATHI)	SOLR2070
WN= WNSA + WNCS + WNT + WNEC + WNSC + WPIN + WHS	SOLR2080
IF(IPSM.GT.0) WRITE(6,PINTL)	SOLR2090
C**** COMPUTE FORWARD HEAD WEIGHT	SOLR2100
TFH=0.54*REFH*DCASE*PCHI/SIGMTL	SOLR2110
XLFH=DCASE/(2.*REFH)	SOLR2120
AIGN=AIAT*ATLO	SOLR2130
C**** COMPUTE FORWARD HEAD STRUCTURE WEIGHT	SOLR2140
REFH2=REFH*REFH	SOLR2150
TERMA=(REFH + SQRT(REFH2-1.))/(REFH - SQRT(REFH2-1.))	SOLR2160
TERMB=0.3925/(REFH*SQRT(REFH2-1.))	SOLR2170
WSEH=RHOMTL*TFH*(DCASE**2*(0.7854 + TERMB*ALOG(TERMA))-AIGN)	SOLR2180
TIFH= (TIAHM + 2.*TIC)/4.	SOLR2190
C**** COMPUTE FORWARD HEAD INSULATION WEIGHT	SOLR2200
TERMC=(REFH + SQRT(REFH2 + 1.))/(REFH - SQRT(REFH2 - 1.))	SOLR2210
WIFH=TIFH*RHOINS*((DCASE-2.*TFH)**2*(0.7854 + TERMB*ALOG(TERMC))	SOLR2220
1-AIGN)	SOLR2230
WBFH=3.*RHOINS*SQRT(ATLO)	SOLR2240

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WFH=WSFH + WIFH + WBFH
REAH2=REAH*REAH
XLAH=SQRT(0.25*DCASE**2 - ANOZI/PI)/REAH
TAH=0.54*REAH*DCASE*PCHI/SIGMTL
C**** COMPUTE AFT HEAD STRUCTURE WEIGHT
TERMD=(REAH + SQRT(REAH2 - 1.))/(REAH - SQRT(REAH2 - 1.))
TERME=0.3925/(REAH*SQRT(REAH2 - 1.))
WSAH=TAH*RHOMTL*(DCASE**2*(0.7854 + TERME*ALOG(TERMD)) - ANOZI)
TIAH=(TIAHM + TIC)/2.
TERMF=(REAH + SQRT(REAH2 - 1.))/(REAH - SQRT(REAH2 - 1.))
WIAH=TIAH*RHOMINS*((DCASE-2.*TAH)**2*(0.7854 + TERME*ALOG(TERMF))
1-ANOZI)
WPAH=17.76*TAH*RHOMTL*DCASE
WAH=WSAH + WIAH + WBAH
IF(IPSM.GT.C) WRITE(6,FWDFT)
C****COMPUTE SKIPT WEIGHTS
TWC=1.08*DCASE*PCHI/SIGMTL
IF(TWC.LT.0.02)TWC=0.02
WFS=PI*RHOMTL*DCASE*TWC*XLFH
PS = 0.0
DELS = 0.0
XLNS=(1.-PS/100.)*XLNOZ
RTLSOL = XLAH + XLNS
XX66(64) = RTLSOL
WAS=PI*RHOMTL*DCASE*TWC*(XLAH + XLNS - 0.25*DEXIT)
XLAS=XLAH + XLNS - 0.25*DEXIT
C****COMPUTE HEAD PROPELLANT WEIGHTS
AP=ATLO*APAT
TERMG=(0.5*DCASE - TFH - TIC)**2
TERMH=(0.5*DCASE/REFH-TFH-TIAHM)
TERMI=AP*DCASE*0.5/REFH
WPFH=0.9*RHOP*((2.09*TERMG*TERMH)-TERMI)
RZERO=1.299*DTHT
AZERO=PI*RZERO*RZERO
RP=SQRT(AP/PI)
TERMJ=0.75 + DELS
TERMK=ANOZI-AP
TERML=(RZERO-RP)/0.577
TERMM=AZERO + AP + SQRT(AZERO*AP)
XLPP=TERMJ + TERML
TTTX=XLAH - TAH - TIAHM
WPR=PHOP*(TERMJ*TERMK + TERML*(TERMM/3. - AP))
DELSP=DELS + 0.75
IF(XLPP.LE.TTTX) GO TO 800
XLVC=XLPP - TTTX
RONE=XLVC*0.577 + RP
AQNF=PI*RONE*RONE
TERMLL=RZERO-RONE
WPAHR=RHOP*(TERMJ*TERMK + (TERMLL/0.577)*(0.333*(AZERO + AQNF
1 + SQRT(AZERO*AQNF)) - AP))
IF(IPSM.GT.C) WRITE(6,DOG)
GO TO 550
800 WPAHR=WPR
IF(IPSM.GT.C) WRITE(6,DOG)
GO TO 550

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550	CONTINUE	SOLR2800
	TERMN=(.5*DCASE - TAH - TIC)**2	SOLR2810
	TERMQ= 0.5*DCASE/REAH - TAH - TIAHM	SOLR2820
	WPAH=RHOP*(2.09*TERMN*TERMQ -AP*TERMQ)- WPAHR	SOLR2830
	WPCR=WPR-WPAHR	SOLR2840
	IF(IPSM.GT.0) WRITE(6,CAT)	SOLR2850
	IF(ISIZ.EQ.1) GO TO 5000	SOLR2860
C****	COMPUTE WEIGHTS FOR WT. INPUT	SOLR2870
	TERMP= 0.01766*DCASE*SQRT(AP)/REFH	SOLR2880
	TERMQ=PI*RHOMTL*DCASE*TWC	SOLR2890
	TERMR=PI*RHOINS*TIC	SOLR2900
	TERMS= DCASE - 2.*TWC	SOLR2910
	TERMT= (0.5*DCASE - TWC - TIC)**2	SOLR2920
	XLC=(WVEH - WFH -WAH -WMISC - TERMP - WPFH - WPAH - WN-WPAY+WPCR	SOLR2930
	1-WASURF)/	SOLR2940
	1(TERMQ + TERMR*TERMS + RHOP*(TERMT*PI - AP) + 0.01766*SQRT(AP))	SOLR2950
	IF(XLC.LE.0.0) GO TO 998	SOLR2960
	XLN=XLNS + XLAH + XLC + XLFH	SOLR2970
	WSC=PI*RHOMTL*TWC*DCASE*XLC	SOLR2980
	WIC=PI*TIC*RHOINS*(DCASE - 2.*TWC)*XLC	SOLR2990
	WPC=((0.5*DCASE -TWC - TIC)**2*PI -AP)*RHOP*XLC - WPCR	SOLR3000
	WC=WSC + WIC	SOLR3010
	WI= 0.01766*SQRT(AP)*(XLC + DCASE/REFH)	SOLR3020
	WP=WPFH + WPAH + WPC	SOLR3030
	WM= WN + WAH + WC + WFH + WI + WMISC + WP	SOLR3040
	IF(IPSM.GT.0) WRITE(6,WINPUT)	SOLR3050
	GO TO 5050	SOLR3060
C*****	COMPUTE WEIGHTS FOR LENGTH INPUT OPTION*****	SOLR3070
5000	CONTINUE	SOLR3080
	IF(IPSM.GT.0) WRITE(6,CAT)	SOLR3090
	XLV=XTOTAL	SOLR3100
	XLC= XLV -XLNS - XLAH - XLFH	SOLR3110
	IF(XLC.LE.0.0) GO TO 998	SOLR3120
	XLN= XLNS + XLAH + XLC + XLFH	SOLR3130
	WSC= PI*RHOMTL*TWC*DCASE*XLC	SOLR3140
	WIC= PI*TIC*RHOINS*XLC*(DCASE - 2.*TWC)	SOLR3150
	WC=WSC + WIC	SOLR3160
	WI= 0.01766*SQRT(AP)*(XLC + DCASE/REFH)	SOLR3170
	WPC=((0.5*DCASE - TWC -TIC)**2*PI - AP)*RHOP*XLC - WPCR	SOLR3180
	WP=WPAH + WPFH + WPC	SOLR3190
	WM= WN + WAH + WC + WFH + WI + WMISC + WP	SOLR3200
5050	XMISC=0.5*(XLFH + XLC + XLAH)	SOLR3210
	TOTIMH = WP * XISPFI * ETAISP	SOLR3220
	TOTIML = WP * XISPLO * ETAISP	SOLR3230
	TRURNL=TOTIML/FLO	SOLR3240
	TRURNH=TOTIMH/FHI	SOLR3250
	WVEH=WM + WPAY + WASURF	SOLR3260
	IF(ITHR.EQ.1) GO TO 5060	SOLR3270
	TOW=FHI/WVEH	SOLR3280
	GO TO 5065	SOLR3290
5060	TOW=FHI/WVEH	SOLR3300
	TOWERR=TOWDES-TOW	SOLR3310
	IF(ABS(TOWERR).LE.0.1) GO TO 5065	SOLR3320
5075	FHI=TOWDES*WVEH	SOLR3330
	FLO=FHI/TRATIO	SOLR3340

KCOUNT=KCOUNT + 1	SOLR3350
IF (IPSM .GT. 0) WRITE(6,TOWPR)	SOLR3360
IF(KCOUNT.GT.10) GO TO 958	SOLR3370
GO TO 12	SOLR3380
5065 CONTINUE	SOLR3390
WPOVWD=WP/WVEH	SOLR3400
STGLDD=XLM/DCASE	SOLR3410
CALL LINE(6,STGLDD,TAPPRC(1),RGPOVL)	SOLR3420
RGP=RGPOVL*XLM	SOLR3430
XIPTCH=WM*RG**2	SOLR3440
RGROVD=0.35	SOLR3450
RGR=RGROVD*DCASE	SOLR3460
XIPOLL=WM*RGR**2	SOLR3470
WINERT=WM-WP	SOLR3480
PMF=WP/WM	SOLR3490
XLK= XLAH + XLC + XLFH	SOLR3500
ZNSA= XLK + 1.	SOLR3510
RT=0.5*CTHRT	SOLR3520
ZNCS= XLK + XL4/3. + 0.144*(TIAHM + 0.25)*((3*RT + RNOZI + 0.75)/	SOLR3530
1(1.5*RT + RNOZI + 0.5)) - TIAHM - 0.25	SOLR3540
ZNT= XLK + XL4 + (XL3 + XL2)/2. - TIAHM - 0.25	SOLR3550
ZFC= XLK + XL4 + XL3 + XL2 + XL1 - 0.3333*XL1*((4.0*RT*(2.-	SOLR3560
1COS(PHINOZ) +DEXIT))/2.*RT*(2.-COS(PHINOZ) + DEXIT)))	SOLR3570
ZPIN=XLK - 1.73*RNOZI + 5.53*RT + 1.56	SOLR3580
ZHS= ZNT	SOLR3590
ZBFH=0.0	SOLR3600
ZSFH= XLFH/2. + TFH/4.	SOLR3610
ZIFH=(XLFH + TFH)/2. + TIAHM/4.	SOLR3620
ZPFH1= 0.625*XLFH + 0.375*(TFH + TIFH)	SOLR3630
ZPFH2= 0.5*(XLFH + TFH + TIFH)	SOLR3640
HPEH1= 0.5*DCASE/EEH -TFH -TIFH	SOLR3650
RPEH1= 0.5*DCASE -TFH - TIC	SOLR3660
WPEH1= 0.6667*PI * RHOP * HPEH1 * RPEH1**2	SOLR3670
WPEH2=RHOP*AP*HPEH1	SOLR3680
ZPEH=(ZPFH1*WPEH1 - ZPFH2 * WPEH2)/(WPEH1 - WPEH2)	SOLR3690
ZPAH=XLK	SOLR3700
ZSAH= XLK-(XLAH + 0.125)/2.	SOLR3710
ZIAH= XLFH+ XLC + 0.5*(XLAH-0.25 - 0.5*TIAHM)	SOLR3720
ZPAH= XLFH + XLC + 0.375*(XLAH - 0.25 - TIAHM)	SOLR3730
ZC= 0.5*XLC + XLFH	SOLR3740
ZP=(ZPFH*WPEH + ZPAH*WPAH + ZC*WPC)/WP	SOLR3750
ZFS= 0.5*XLFH	SOLR3760
ZAS= XLFH + XLC + 0.5*(XLAH +XLNS -0.25*DEXIT)	SOLR3770
ZI = 11.2* WI/AGN	SOLR3780
XMOME= WNSA*ZNSA + WNCS*ZNCS + WNT*ZNT + WNSC*ZEC + WNEC*ZEC	SOLR3790
1 + WPIN*ZPIN + WAS*ZHS + WBFH*ZBFH + WSFH*ZSFH + WIFH*ZIFH	SOLR3800
2 + ZPEH*WPEH + WPAH*ZBAH + WSAH*ZSAH + WIAH*ZIAH + ZPAH*WPAH	SOLR3810
3 + ZC*WC + ZFS*WFS + ZAS*WAS + ZI*WI	SOLR3820
XCGMBX= XMOME/(WM-WP)	SOLR3830
XCLAX=(XMOME + ZP*WP)/WM	SOLR3840
IF (IPSM .LE. 0) GO TO 606	SOLR3850
WRITE(6,CGRAV)	SOLR3860
WRITE(6,XINPUT)	SOLR3870
WRITE(6,XMCI)	SOLR3880
WRITE(6,CG)	SOLR3890

600	CONTINUE	SOLR3900
	IF (IPSM .LE. 0) GO TO 606	SOLR3910
	WRITE(6,XINPUT)	SOLR3920
	WRITE(6,XMOI)	SOLR3930
	WRITE(6,CG)	SOLR3940
606	CONTINUE	SOLR3950
	IF(IPSM.FQ.0) GO TO 999	SOLR3960
	CALL PAGE	SOLR3970
	WRITE(6,6000)	SOLR3980
6000	FORMAT(/10X,27H PINTLE NOZZLE SOLID ROCKET)	SOLR3990
	IF(ISIZ.LE.1)GO TO 6001	SOLR4000
5900	FORMAT(/30X,14HCASE DIAMETER=,F5.2,4H IN.,4X,19HWEIGHT INPUT OPTIO	SOLR4010
	IN,3X,15HVEHICLE WEIGHT=,F10.3,4H LB.)	SOLR4020
	GO TO 6022	SOLR4030
6001	CONTINUE	SOLR4040
	IF(IPSM.FQ.0) GO TO 999	SOLR4050
5800	FORMAT(/30X,14HCASE DIAMETER=,F5.2,4H IN.,4X,19HLENGTH INPUT OPTIO	SOLR4060
	IN,3X,15HVEHICLE LENGTH=,F10.3,4H IN.)	SOLR4070
6022	IF(ITHP.LT.1) GO TO 6050	SOLR4080
6040	CONTINUE	SOLR4090
6080	FORMAT(/30X,30HDESIGN THRUST TO WEIGHT RATIO=,F6.2,5X,15HTHRCTTLE	SOLR4100
	RATIO=,F6.2)	SOLR4110
	GO TO 6002	SOLR4120
6050	CONTINUE	SOLR4130
6090	FORMAT(/30X,14HDESIGN THRUST=,F10.2,4H LBF,13X,23HTHRUST TO WEIGHT	SOLR4140
	RATIO=,F6.2)	SOLR4150
	GO TO 6002	SOLR4160
558	KFAIL=1	SOLR4170
	IF(IPSM.FQ.0) GO TO 999	SOLR4180
	WRITE(6,7500)	SOLR4190
7500	FORMAT(/40X,42HCYLINDER LENGTH EQUAL TO OR LESS THAN ZERO)	SOLR4200
	GO TO 999	SOLR4210
6002	CONTINUE	SOLR4220
	IF(IPSM.FQ.0) GO TO 999	SOLR4230
	WRITE(6,6100)	SOLR4240
6100	FORMAT(/10X,9HCOMPONENT,15X,10HWEIGHT-LB.,5X,10HLENGTH-IN.,	SOLR4250
	118X,39HPERFORMANCE PARAMETERS(COMPOSITE HTPR))	SOLR4260
	WRITE(6,6200)WFS,XLFH,FHI	SOLR4270
6200	FORMAT(/10X,13HFORWARD SKIRT,11X,F10.3,5X,F10.3,18X,15HMAXIMUM THR	SOLR4280
	UST= ,F10.3,4H LBF)	SOLR4290
	WRITE(6,6300)WFH,XLFH,FLC	SOLR4300
6300	FORMAT(/10X,12HFORWARD HEAD,12X,F10.3,5X,F10.3,18X,15HMINIMUM THR	SOLR4310
	UST= ,F10.3,4H LBF)	SOLR4320
	WRITE(6,6400)WC,XLC,XISPHI	SOLR4330
6400	FORMAT(/10X,8HCYLINDER,16X,F10.3,5X,F10.3,18X,15HISP AT MAX THR=,	SOLR4340
	IF10.3,4H SEC)	SOLR4350
	WRITE(6,6500)WAP,XLAH,XISPLC	SOLR4360
6500	FORMAT(/10X,8HAFT HEAD,16X,F10.3,5X,F10.3,18X,15HISP AT MIN THR=,	SOLR4370
	IF10.3,4H SEC)	SOLR4380
	WRITE(6,6600)WN,XLNOZ,PCHI	SOLR4390
6600	FORMAT(/10X,13HNOZZLE(TOTAL),11X,F10.3,5X,F10.3,18X,15HPC AT MAX	SOLR4400
	ITFP=,F10.3,5H PSIA)	SOLR4410
	WRITE(6,6700)XLNS,PCLQ(I)	SOLR4420
6700	FORMAT(/10X,16HNOZZLE(EXTERNAL),23X,F10.3,18X,15HPC AT MIN THR=,	SOLR4430
	IF10.3,5H PSIA)	SOLR4440


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        WRITE(6,6800)WAS,XLAS,ATHI                                SOLR4450
6800  FORMAT(/10X,9HAFT SKIPT,15X,F10.3,5X,F10.3,18X,15HTHROAT AREA AT , SOLR4460
        1/77X,15HMAX THRUST    =,F10.3,8H SQ. IN. )              SOLR4470
        WRITE(6,6900)WMISC,ATLO                                    SOLR4480
6900  FORMAT(/10X,13HMISCELLANEOUS,11X,F10.3, 33X,15HTHRCAT AREA AT , SOLR4490
        1/78X,15HMIN THRUST    =,F10.3,8H SQ. IN. )              SOLR4500
        WRITE(6,7000)WM,DEXIT                                       SOLR4510
7000  FORMAT(/10X,19HTOTAL MOTOR WEIGHT=,F10.3,4H LB.,34X,15HEXIT DIA. SOLR4520
        1    =,F10.3,4H IN. )                                       SOLR4530
        WRITE(6,7100)WINEPT,EPhi                                    SOLR4540
7100  FORMAT(/10X,19HTOTAL INERT WEIGHT=,F10.3,4H LB.,34X,15HEXP. RATIO SOLR4550
        1AT  ,/77X,15HMAX THRUST    =,4X,F5.2)                    SOLR4560
        WRITE(6,7200)WP,EPL0                                       SOLR4570
7200  FORMAT(/10X,19HTOTAL PROP. WEIGHT=,F10.3,4H LB.,34X,15HEXP. RATIO SOLR4580
        1AT  ,/77X,15HMIN THRUST    =,4X,F5.2)                    SOLR4590
        WRITE(6,7300)XLM,TOTIMH                                       SOLR4600
7300  FORMAT(/10X,19HTOTAL MOTOR LENGTH=,F10.3,4H IN.,34X,13HTOTAL IMPULSOLR4610
        1SF,/77X,16HAT MAX THRUST    =,F10.2,7H LB-SEC )          SOLR4620
        WRITE(6,7400)PMF,TOTIML                                       SOLR4630
7400  FORMAT(/10X,19HPROP. WT. FRACTION=,3X,F5.2,40X,13HTOTAL IMPULSF, SOLR4640
        1/77X,16HAT MIN THRUST    =,F10.2,7H LB-SEC )            SOLR4650
        WRITE(6,7500)WVFH                                             SOLR4660
7500  FORMAT(10X,19HMISSILE WEIGHT    =,F10.3)                     SOLR4670
        WRITE(6,7600)TOW,TRURNH                                       SOLR4680
7600  FORMAT(/10X,19HTHRUST TO WEIGHT    =,F6.2,42X,13HBURN TIME AT ,/77X, SOLR4690
        116HMAX THRUST    =,F6.2,4H SEC )                            SOLR4700
        WRITE(6,7700)TRURNL                                           SOLR4710
7700  FORMAT(/77X,13HBURN TIME AT ,/77X,16HMIN THRUST    =,F8.2, SOLR4720
        14F SEC )                                                    SOLR4730
        WRITE(6,7800)WPDVWO                                           SOLR4740
7800  FORMAT(/10X,19HMISSILE MASS RATIO=,3X,F5.2)                 SOLR4750
559  CONTINUE                                                         SOLR4760
      WMC=WSFH+WBFH+WSAH+WPAH+WFS+WAS+WSC                           SOLR4770
      DP = (WIFH+WIAH+WIC) / RHOINS                                  SOLR4780
      WNX = WM                                                         SOLR4790
      WPX=WP                                                           SOLR4800
      WMX = WM                                                         SOLR4810
      RETURN                                                           SOLR4820
      END                                                             SOLR4830

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C  SUBROUTINE ROCLIO (IPER, FREQD, XISP, WDXT, KFAIL)                ROCL0010
    PGM=NUK.CMCGSM          GGJ/RKM          FIV/EBCD          9/10/73 ROCL0020
    COMMON /SOLMIS/ SOL9(9), WSECT                                ROCL0030
    COMMON /COMVLS/ COM(51)                                       ROCL0040
    EQUIVALENCE(COM(24), WT),                                     ROCL0050
    1 (COM(25),WFX),                                              ROCL0060
    2 (COM(26),FMAX),                                              ROCL0070
    2 (COM(40),WTC),                                              ROCL0080
    3 (COM(41),WTPX),                                              ROCL0090
    4 (COM(42),WGG),                                              ROCL0100
    5 (COM(43),WSC),                                              ROCL0110
    6 (COM(44),WLV),                                              ROCL0120
    7 (COM(45),VGT),                                              ROCL0130

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8 (COM(46),WO),	ROCL0140
9 (COM(47),WPX),	ROCL0150
A (COM(50),METALX)	ROCL0160
DIMENSION X(3), NINV(3)	ROCL0170
COMMON/MOOL/ OD(30)	ROCL0180
EQUIVALENCE (TSKINI,OD(1)), (TCWI, OD(2)), (TFRAC,CD(3)),	ROCL0190
1 (SAFAC, OD(4)), (IWTANK,OD(5)), (WSKNPL, OD(6)),	ROCL0200
2 (WPAYL, OD(7)), (IWTPL,OD(8)), (WSINPU, OD(9)), (WOVAST, CD(10)),	ROCL0210
3 (DRT, OD(11))	ROCL0220
EQUIVALENCE (OD(12), ITANK)	ROCL0230
COMMON/CODEXX/ ZO(2), ISIZ, ZAP(13)	ROCL0240
COMMON /LIQCUT/ XLTP, WTP, WOXTNK, WFTANK,	ROCL0250
1 XLTOX,WOX, XLTF,Wf,XXLPS, WPROPI, WNOZ	ROCL0260
COMMON/PPINTR/ IPSM,I76(6)	ROCL0270
COMMON/ROCKET/ XISPTH, XMRT, ETAISP, PCHAMB, FENG,ETACF,PBELL,	ROCL0280
1C1,C2,C3,C4,C5,C6,C7,C8,XLSTAR,ZT,WOVAC2,EXS1,WOVAC1,DCASE,	ROCL0290
2WOVAN1,WOVAN2,RHOCC,PVOX,REH,METAL,XLVEH,STGW,XLPAYI,WASURF,WPL,	ROCL0300
3WMISCL,RHOF,ITHR,TOWDES,TRATIO,FDES,XOLMIS	ROCL0310
COMMON/ROCL/ TABISP(631)	ROCL0320
COMMON/ROCLX/ TABEXR(817)	ROCL0330
COMMON/SAVL/ FLOS,FHIS,PCHAMS,EPSS,SISPLO, SISPHI, DEXITS	ROCL0340
COMMON/TABSEX/ NPC,NMR,NISP,NPCP,NMRP,NEXR	ROCL0350
COMMON/TOVPER/GRX(4),WP,SEXIT,XXX(66)	ROCL0360
EQUIVALENCE (XXX(66),XLPS), (XXX(64), BTLQ),(XXX(2),WVFH)	ROCL0370
	ROCL0380
	ROCL0390
NAMLIST/TCHAMB/XK3, WOOTTE, WDOTPT, FTHR, CSTAR, CFTT, CFDEL,	ROCL0400
1 ATHRT, DTHRT, EPS, DET, XK2T, DCT, XLJT, XLC1T, XLC2T, XLNT,	ROCL0410
2 XLTHR,WINJ, WC1T, WC2T, WN1T, WN2T, WTC,EPSP,AREFN,SEXIT	ROCL0420
NAMLIST/TPUMP/ WDOTOT, WDOTFT, WDOTGG, WDOTCG, WDOTOF, WDOTFG,	ROCL0430
1 WDOTFE, WPEST, WOX, VTOX, XNPSHO, PNPSHO, PTOX, QCX, QF, DPJ,	ROCL0440
2 DPVP, PPOX, DELHOX, DELHEP, PTMAN, D1T, XNF, D2T, TTURBH, DTURB,	ROCL0450
3 W1T, W2T, W3T, W4T, WTURB, XLTURB	ROCL0460
NAMLIST/OXPUMP/ DIPOX, DTPOX, XL1POX, XL2POX, D3POX, TPCXH,	ROCL0470
1 XL5POX, WIPOX, TERMA, TERMB, TERMC, TERMD, W2POX, W3POX,	ROCL0480
2 W4POX, W5POX, W6POX, D6POX, W7POX, W8POX, DIPF, W9POX,	ROCL0490
3 WPOX, XLPOX	ROCL0500
NAMLIST/FULPMP/ DIPF, DIPF, XL1PF, XL2PF, D3PF, TPF, TERME,	ROCL0510
1 TERME, XL5PF, W1PF, TERMG, TERMH, W2PF, W3PF, W4PF, W5PF,	ROCL0520
2 W6PF, W7PF, W8PF, W9PF, WPF, XLPF, XLTP, DDTE, TOTE, WDTF,	ROCL0530
3 WGG, WSC, WTP	ROCL0540
NAMLIST/VANDL/ DLOM, TLOM, WFUEL, VOLFT, XLCFT, XLLOM, ALOM,	ROCL0550
1 WLOM, CLFM, DLLOL, TLOL, ALOL, WLOL, DLFL, TLFL, ALFL, WLFL,	ROCL0560
2 DLOH, TLOH, ALOH, WLOH, DLFH, TLFH,ALFH, WLFH, DLGG, ALGG,	ROCL0570
3 WLOGG, DLFGG, ALFGG, WLFGG, WVID, WVIF, WVTO, WVTF, PCTERM,	ROCL0580
4 WVO, WVF, WVGGO, WVGGF, WLV	ROCL0590
NAMLIST/TANKW1/ TC, THEAD, TERMJ,TERMK, SH, WSH, TFRML, TERMM,	ROCL0600
1 VOLHD, RHOP, WDOTG, DGL, WREG, WSV, WRV, WPSME, XLFS, AFS, WFS,	ROCL0610
2 XLAS, AAS, WAS, WSTR, WMISC, WSUM, FGGT, RTI, XLC, WVFH, VC,	ROCL0620
3 VT, WSC, WB, WTANK,XLTANK,XTOTAL, WGAS, DGT, XLTP, DTURB	ROCL0630
NAMLIST/TANKW2/ XLTAPP, XLH, RTI, VOLHD, XLC, VT, WGAS, VGT,	ROCL0640
1 DGT, XLTANK, WSH, WSC, WB, XLFS, AFS, WFS, XLAS, AAS, WAS,	ROCL0650
2 VP, WP, WGAS, VGT, DGT, WGT, WDOTG, DGL, WREG, WSV, WRV, WPSME,	ROCL0660
3 WPS,WTANK,WPROPI, WPROPS, WVEH, WPOVWD, PMF, XIMF,TCTIMH,TRURNH	ROCL0670
NAMLIST/TCTPCG/ XLPS, RT, ZBARN2, DEPI, ZBARN1, XLN1, XLN2,	ROCL0680

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1 ZBARC2, ZBARC1, ZBARJ, ZBARTC, ZBARTP, WOX, WF, XLCOX, XLTOX,	RDCL0690
2 XLTF, ZPAROS, ZBARMH, WTOS, ZBART, ZBARPS, ZBAROX, ZBARF,	RDCL0700
3 WQXTNK, WFTANK	RDCL0710
NAMFLIST/VLOG/ ZLOM, ZLOL, ZLFL, ZLOH, ZLFH, ZLOGG, ZLEGG,	RDCL0720
1 ZLM, ZVFO, ZVFF, ZVIC, ZVIF, ZVTO, ZVTF, ZVO, ZVF, ZVGGC,	RDCL0730
2 ZVGGF, XMOE, XCGE, XCGF	RDCL0740
NAMFLIST/BUG/ XLVEH, XLPAYI, XLTHR, XLTP, XLH, RTI, TC, VOLHD,	RDCL0750
1 XLC, SH, VT, WGAS, VGT, DGT, XLTANK, XLTAPP, KOUNT, XLTAPR	RDCL0760
NAMFLIST/TOWPR/ TOWDES, TOW, TCWERR, KCNT, FHI, WVEH	RDCL0770
NAMFLIST/BUG1/ KBUG, IPERF, XISPL0, XISPHI, SISPL0, SISPHI, FLO, FHI,	RDCL0780
1 FHI, WDOT, EPSS, EPSR, PCHAMS, PCHLO, PCHX, XISPL, XMRT, EPS, ENGISP	RDCL0790
NAMFLIST/TANK3/ IKTANK, TC, VOLHD, RHOOX, RHOF, TERAC, WSKINP,	RDCL0800
1 WSKINM, XLMS, WMS, WSUM, FGGT, C1, C2, C3, XLCF, XLCO, VCO, VCF, VTO, VTF,	RDCL0810
2 WSCF, WPF, WRD, WTO, WTF, WTANK, XLTO, XLTF, XLTANK	RDCL0820
NAMFLIST/INPUT/ XISPTH, XMPT, ETAISP, PCHAMB, FENG, ETACF, PBELL, ISIZ,	RDCL0830
1C1, C2, C3, C4, C5, C6, C7, C8, XLSTAR, ZT, WOVAC2, EXS1, WCVAC1, DCASF,	RDCL0840
2WOVAN1, WOVAN2, PHOOX, PVOX, REH, METAL, XLVEH, STGW, XLPAYI	RDCL0850
3, WASURF, WPL, WMISCL, RHOF, ITHR, TOWDES, TRATIO, FDES, FREQ, XOLMIS	RDCL0860
C	RDCL0870
C	RDCL0880
WMS = 0.	RDCL0890
IF (IPSM .GT. 0) WRITE (6, INPUT)	RDCL0900
C****THRUST CHAMBER COMPUTATIONS***	RDCL0910
IF (TERAC .GT. 1.) TERAC = 1.	RDCL0920
RH7X = RHOOX	RDCL0930
RH2F = RHOF	RDCL0940
XXX(65)=XLPAYI	RDCL0950
IPERF=IPER	RDCL0960
WDOT=WDXT	RDCL0970
FREQ=FREQD	RDCL0980
IF(IPERF.EQ.1) GO TO 12	RDCL0990
PI=3.14159	RDCL1000
WVEH=STGW	RDCL1010
XISPTT=XISPTH	RDCL1020
11 CISPTE=ETAISP*XISPTT	RDCL1030
KBUG=6	RDCL1040
IF(IPSM.GT.0) WRITE(6,RUG1)	RDCL1050
IF(PCHAMB.GT.2000.) PCHAMB=2000.	RDCL1060
IF(PCHAMB.LT.20.) PCHAMB=20.	RDCL1070
XK3=1.0-1.523E-5*PCHAMB	RDCL1080
ENGISP=XK3*CISPTE	RDCL1090
WEST=0.32725*DCASF**3	RDCL1100
C*****SET MAXIMUM THRUST*****	RDCL1110
FHI=TOWDES*WEST	RDCL1120
IF(ITHR.EQ.0) FHI=FDES	RDCL1130
FFNG=FHI	RDCL1140
C*****SET MINIMUM THRUST*****	RDCL1150
FLO=FHI/TRATIO	RDCL1160
KCNT=0	RDCL1170
12 CONTINUE	RDCL1180
IF(IPERF.EQ.0) GO TO 13	RDCL1190
IF(FREQ.LE.FLOS) GO TO 131	RDCL1200
IF(FREQ.GE.FHIS) GO TO 132	RDCL1210
FLO=FREQ	RDCL1220
FHI=FHIS	RDCL1230

PCHAMB=PCHAMS	ROCL1240
DEXIT=DEXITS	ROCL1250
PRATIO=FHI/FREQ	ROCL1260
PCHX=PCHAMS/PRATIO	ROCL1270
FENG=FREQ	ROCL1280
FPSR=EPSS	ROCL1290
IF(IPERF.EQ.1) X(1)=PCHX	ROCL1300
X(2)=XMRT	ROCL1310
X(3)=FPSR	ROCL1320
NINV(1)=NPCP	ROCL1330
NINV(2)=NMRP	ROCL1340
NINV(3)=NEXR	ROCL1350
CALL FASTS(NVAR,NINV,TABISP(1), X, XISPLO)	ROCL1360
DISPLO=ETAISP*XISPLO	ROCL1370
IF(PCHX.LT.20.) PCHX=20.	ROCL1380
XISP = XK3 * DISPLO	ROCL1390
WDOTCR=FREQ/ XISP	ROCL1400
WDOT=WDOTCR	ROCL1410
KBUG=1	ROCL1420
IF(IPSM.GT.0) WRITE(6,BUG1)	ROCL1430
RETURN	ROCL1440
131 FLO=FL0S	ROCL1450
XISPLO=SISPLO	ROCL1460
KBUG=2	ROCL1470
IF(IPSM.GT.0) WRITE(6,BUG1)	ROCL1480
GO TO 985	ROCL1490
132 FHI=FHIS	ROCL1500
XISPHI=SISPHI	ROCL1510
KBUG=3	ROCL1520
IF(IPSM.GT.0) WRITE(6,BUG1)	ROCL1530
GO TO 986	ROCL1540
13 CONTINUE	ROCL1550
KBUG=4	ROCL1560
IF(IPSM.GT.0) WRITE(6,BUG1)	ROCL1570
FENG=FHI	ROCL1580
WDOTE=FENG/ENGISP	ROCL1590
WDOTPT=(FENG-WDOTE*61.8)/(DISPT-61.8)	ROCL1600
FTHR=WDOTPT*DISPT	ROCL1610
IF(DET.EQ.(DCASE-1.)) GO TO 990	ROCL1620
CSTAR=C1*PCHAMB**C2 - C3*PCHAMB**C4*(ABS(C5*PCHAMB**C6 - XMRT))	ROCL1630
1** (C7 + PCHAMB*C8)	ROCL1640
CFTT=XISPPT*32.17/CSTAR	ROCL1650
CFDEL=ETACF*CFTT	ROCL1660
ATHRT=FTHR/(CFDEL*PCHAMB)	ROCL1670
CTHRT=2.0*SQR(ATHRT/3.14159)	ROCL1680
X(1)=PCHAMB	ROCL1690
X(2)=XMRT	ROCL1700
X(3)=XISPPT	ROCL1710
NVAR=3	ROCL1720
NINV(1)=NPC	ROCL1730
NINV(2)=NMR	ROCL1740
NINV(3)=NISP	ROCL1750
C	ROCL1760
C LOCK UP EXPANSION RATIO FOR GIVEN CHAMBER PRESSURE, MIXTURE	ROCL1770
C RATIO, AND THEORETICAL SPECIFIC IMPULSE	ROCL1780

C	CALL FASTS(NVAR,NINV,TABEXR(1),X,EPS)	ROCL1790
	DET=DTHT*SQRT(EPS)	ROCL1800
	SFXIT=0.25*PI*DET**2	ROCL1810
C	*****TEST NOZZLE DIA. VS. MISSILE DIA.	ROCL1820
C	***** IF NOZZLE EXIT DIA. IS GREATER THAN MISSILE DIA. SET EXIT	ROCL1830
C	AREA AND FIND THEORETICAL ISP FOR NEW EXPANSION RATIO	ROCL1840
	IF(DET-(DCASE-1.).GT.0.1) GO TO 99	ROCL1850
	GO TO 990	ROCL1860
99	DET=DCASE-1.	ROCL1870
	AREFN=0.25*PI*(DCASE-1.)**2	ROCL1880
	SEXIT=AREFN	ROCL1890
	EPSR=AREFN/ATHRT	ROCL1900
	X(1)=PCHAMR	ROCL1910
	X(2)=XMRT	ROCL1920
	X(3)=EPSR	ROCL1930
	NVAR=3	ROCL1940
	NINV(1)=NPCP	ROCL1950
	NINV(2)=NMRP	ROCL1960
	NINV(3)=NFXR	ROCL1970
	CALL FASTS(NVAR,NINV,TABISP(1),X,XISPTT)	ROCL1980
	IF(IPERF.EQ.0) GO TO 11	ROCL1990
990	CONTINUE	ROCL2000
	PCHLO=PCHAMR/TRATIO	ROCL2010
	X(1)=PCHLO	ROCL2020
	X(2)=XMRT	ROCL2030
	X(3)=EPS	ROCL2040
	IF(DET.EQ.(DCASE-1.)) X(3)=FPSR	ROCL2050
	NINV(1)=NPCP	ROCL2060
	NINV(2)=NMRP	ROCL2070
	NINV(3)=NFXR	ROCL2080
C	LOOK UP LOW THRUST ISP AT MINIMUM CHAMBER PRESSURE AND SELECTED	ROCL2090
C	MIXTURE RATIO	ROCL2100
C	CALL FASTS(NVAR,NINV,TABISP(1),X,XISPL)	ROCL2110
	DISPLO=FTAI*ISP*XISPL	ROCL2120
	XISPL=XK3*DISPLO	ROCL2130
C	SPECIFIC IMPULSE AT MINIMUM THRUST	ROCL2140
C		ROCL2150
	WCOTLO=FLO/XISPL	ROCL2160
	IF(IPERF.EQ.1) GO TO 985	ROCL2170
C	SAVE VALUES FOR PERFORMANCE ESTIMATES FOR NEXT PASS(IPERF=1)	ROCL2180
	FLOS=FLO	ROCL2190
	FHIS=FHI	ROCL2200
	PCHAMS=PCHAMB	ROCL2210
	SISPL=XISPL	ROCL2220
	SISPHI=ENGISP	ROCL2230
	EPSS=EPS	ROCL2240
	IF(DET.EQ.(DCASE-1.)) EPSS=EPSR	ROCL2250
	DFXITS=DET	ROCL2260
	GO TO 104	ROCL2270
985	CONTINUE	ROCL2280
	WCOT=FLO/XISPL	ROCL2290
	XISP=XISPL	ROCL2300
	IF(IPSM.GT.0) WRITE(6,BUG1)	ROCL2310
		ROCL2320
		ROCL2330

RETURN	ROCL2340
986 CONTINUE	ROCL2350
WCOT=FH!/XISPHI	ROCL2360
XISP = XISPHI	ROCL2370
IF(IPSM.GT.0) WRITE(6,BUG1)	ROCL2380
RETURN	ROCL2390
987 WCOT=FREQ/XISPLO	ROCL2400
XISP = XISPLO	ROCL2410
IF(IPSM.GT.0) WRITE(6,BUG1)	ROCL2420
RETURN	ROCL2430
104 CONTINUE	ROCL2440
KPUG=5	ROCL2450
IF(IPSM.GT.0) WRITE(6,BUG1)	ROCL2460
CTX=DTHRT	ROCL2470
XK2T=((XLSTAR/CTX+ 0.26061)/(ZT + 0.26061))**0.6667	ROCL2480
ECT=DTHRT*SQRT(XK2T)	ROCL2490
XLJT=0.635*ECT	ROCL2500
XLC1T=ZT*ECT	ROCL2510
XLC2T=DTHRT*(SQRT(XK2T)-1.)/1.279	ROCL2520
XLNT=DTHRT*PREFL*(SQRT(EPS)-1.)/53.6	ROCL2530
XLTHR=XLJT + XLC1T + XLC2T + XLNT	ROCL2540
WINJ=0.0136*ECT**3.326	ROCL2550
WC1T=3.14159*ECT*XLC1T*WVAC1	ROCL2560
WC2T=1.375*WVAC2*(XK2T-1.)*DTHRT**2	ROCL2570
EPS1=EXS1	ROCL2580
IF(EPS.LT.15.) EPS1=EPS	ROCL2590
WN1T=2.4734*WVANI*(EPS1-1.)*ATHRT	ROCL2600
WN2T=3.14159*WVAN2*ATHRT*(EPS-EPS1) + 3.1E-9*SQRT(XK2T)*DTHRT	ROCL2610
1**3*PCHAMB**2.08	ROCL2620
WTC=WINJ + WC1T + WC2T + WN1T + WN2T	ROCL2630
WNOZ = WC2T + WN1T + WN2T	ROCL2640
IF(IPSM.GT.0) WRITE(6,TCHAMB)	ROCL2650
C**** THRUSTER WEIGHT IN LBS. ***	ROCL2660
WDOTOT= WDOTPT*XMRT/(1.0 + XMRT)	ROCL2670
WDOTFT= WDOTPT/(1.0 + XMRT)	ROCL2680
WDOTGG= WDOTPT - WDOTFT	ROCL2690
WDOTOG= 0.1*WDOTGG	ROCL2700
WDOTOF= WDOTOT + WDOTOG	ROCL2710
WDOTFG=0.9*WDOTGG	ROCL2720
WDOTFE=WDOTFT + WDOTFG	ROCL2730
C****ESTIMATE PROPELLANT WEIGHTS FOR OXIDIZER TANK CALCULATIONS	ROCL2740
WPEST= 0.121*DCASE**3	ROCL2750
WOX=WPEST*XMRT/(1. + XMRT)	ROCL2760
VTOX=WOX/(0.95*RHOOX)	ROCL2770
XKNPSH=27.0	ROCL2780
XNPSHO=(VTOX**0.2*XKNPSH/RHOOX**0.526)**1.3333	ROCL2790
PNPSHO=XNPSHO*RHOOX/144.	ROCL2800
PVOX=17.2	ROCL2810
PTOX=PNPSHO + PVOX	ROCL2820
QOX=WDOTOF/RHOOX	ROCL2830
PTF=PTOX	ROCL2840
QF=WDOTFE/RPOF	ROCL2850
DPJ= 1.05*PCHAMB**0.8 +30.*(FTHR**0.102 - 1.6)	ROCL2860
DPVP=42.5/FTHR**0.226	ROCL2870
DPVEN=100.	ROCL2880

PPOX=PCFAMB + DPJ + DPVP + DPVEN + 100.	ROCL2890
PPFP=PPOX	ROCL2900
DELHGX=(PPOX-PTOX)*144./RHOOX	ROCL2910
DELHFP=(PPFP-PTF)*144./PHOF	ROCL2920
PTMAN=PCFAMB-100.	ROCL2930
DIT= 19.141*SORT(WDOTGG)/SQRT(PTMAN)	ROCL2940
XNSF=1300.	ROCL2950
XNF=(XNSF*DELHFP**0.75)/(21.2*SQRT(QF))	ROCL2960
IF(XNF.CT.4F4) XNF=4F4	ROCL2970
UTURBT=1400.	ROCL2980
D2T=(720.*UTURBT)/(3.14159*XNF)	ROCL2990
TTURBH= PTMAN*DIT*(2.0 + DIT/(D2T- DIT))/1.6E5	ROCL3000
IF(TTURBH.LT.0.02) TTURBH=0.02	ROCL3010
CTURB= 0.5*DIT + TTURBH + D2T	ROCL3020
RHOMTU=0.29	ROCL3030
W1T=(86627.* UTURBT* TTURBH*RHOMTU)/(XNF*SQRT(PTMAN))	ROCL3040
W1T = W1T * SQRT (WDOTGG)	ROCL3050
W2T= 537410.*UTURBT**2.667*RHOMTU/XNF**2.667	ROCL3060
W3T= 165020.*UTURBT*UTURBT*TTURBH*RHOMTU/XNF**2	ROCL3070
W4T= 82512.*UTURBT*UTURBT*TTURBH*RHOMTU/XNF**2	ROCL3080
WTURB=W1T + W2T + W3T + W4T	ROCL3090
XLTURB= DIT + 0.5*D2T + 3.*TTURBH	ROCL3100
IF(IPSM.GT.0) WRITE(6,TPUMP)	ROCL3110
DIPGX=82.42*QGX**0.333/XNF**0.333	ROCL3120
DTPOX= 22062.0*SQRT((PPOX-PTOX)/RHOOX)/XNF	ROCL3130
IF(DIPGX.GT.0.85*DTPOX) DIPGX=0.85*DTPOX	ROCL3140
XL1POX= DIPGX/2.0	ROCL3150
XL2POX= DTPOX/3.0	ROCL3160
D3POX= 529.25*SQRT(QGX/(XNF*DTPOX))	ROCL3170
TPGXH= PPOX*D3POX*(2.0 + D3POX/DTPOX)/60000.	ROCL3180
TERMA= DTPOX - 0.5*DIPGX	ROCL3190
TERMP= DTPOX/3. - (108864. * QGX/(XNF * DTPOX**2))	ROCL3200
XL5POX= SORT(TERMA*TERMA + TERMB*TERMB)	ROCL3210
RHOMP=0.1	ROCL3220
W1POX=0.2702*RHOMTU*DIPGX *2.667	ROCL3230
TERMC=DTPOX/9. - 21.*QGX/(XNF*DTPOX**2)	ROCL3240
TERMD= DTPOX**2 + DTPOX*DIPGX + DIPGX**2	ROCL3250
W2POX= 0.4292*PI * RHOMTU *(63.* QGX/XNF +	ROCL3260
1*TERMC*TERMD)/DTPOX**0.333	ROCL3270
W3POX= 2.* PI**2*RHOMP*TPGXH*D3POX*(0.5*DTPOX + D3POX/3.)	ROCL3280
W4POX= 0.5*PI*RHOMP*TPGXH*DTPOX**2	ROCL3290
W5POX=PI*TPGXH*RHOMP*(DIPGX**2 + XL5POX*(DIPGX + DTPOX))	ROCL3300
W6POX= 42.336*PPOX * QGX * RHOMTU / XNF	ROCL3310
D6POX=12.*((PPOX*QGX + PPFP*QF)/(600.0*XNF))**0.333	ROCL3320
W7POX=0.6*PI*RHOMP*DIPGX*DTPOX	ROCL3330
W8POX= 0.5685*PI*RHOMP*DIPGX*DTPOX	ROCL3340
CIPF= 82.42*(QF/XNF)**0.333	ROCL3350
W9POX=3.0*PI*DIPF*RHOMP*D6POX*D6POX/16. + 42.34*PPCX * QGX	ROCL3360
1*RHOMP/XNF	ROCL3370
WPOX= W1POX + W2POX + W3POX + W4POX + W5POX + W6POX + W7POX	ROCL3380
1+ W8POX + W9POX	ROCL3390
C	ROCL3400
C*** OXIDIZER PUMP WEIGHT	ROCL3410
C	ROCL3420
XLPOX= XL1POX + XL2POX + 3.0*D6POX + TPOXH	ROCL3430

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C      IF (IPSM.GT.0) WRITE(6,OXPUMP)
C***  OXIDIZER PUMP LENGTH
C
  DTPF= 22062.*SQRT((PPEP - PTMAN)/RHOF)/XNF
  XL1PF=0.5*DIPF
  XL2PF=DTPF/3.
  D3PF= 529.25*SQRT(QF/(XNF*DTPF))
  TPF= PPEP*D3PF*(2.0 + D3PF/DTPF)/6.E4
  TERME= DTPF - DIPF/2.
  TERMF= DTPF/3. - 108864.*QF/(XNF*DTPF*DTPF)
  XL5PF=SQRT(TERME**2 + TERMF**2)
  W1PF=0.2702*RHOMTU*DIPF**2.667
  TERMG= DTPF/9. - 21.*QF/(XNF*DTPF)
  TERMH=DTPF**2 + DTPF*DIPF + DIPF**2
  W2PF=0.4292*PI*          RHOMTU*(0.103*DTPF**2 + TERMG*TERMH)
  I/DIPF**0.333
  W3PF=2.0*PI**2*RHOMP*TPF*D3PF*(0.5*DTPF + D3PF/3.)
  W4PF=0.5*PI*RHOMP*DTPF*DTPF
  W5PF=PI*TPF*RHOMP*((DIPF + DTPF)* XL5PF + DIPF**2)
  W6PF=42.336*PPEP*QF*RHOMTU/XNF
  W7PF=0.6*PI*RHOMP*DIPF**2
  W8PF=0.5685*PI*RHOMP*DIPF**2
  D6PF=D6POX
  W9PF=3.*PI*DIPF*RHOMP*D6PF*D6PF + 42.34*PPEP*QF*RHOMP/XNF
  WPF= W1PF + W2PF + W3PF + W4PF + W5PF + W6PF + W7PF + W8PF + W9PF
C
C***  FUEL PUMP WEIGHT
C
  XLPF= XL1PF + XL2PF + 3.*D6POX + TPF
  XLTP=1.1*(XLTURR + XLPOX + XLPF)
C
C***  TURBOPUMP LENGTH - IN.
C
  DDTE= 1.314*WDDTGG**0.3782
  TDTE=0.020
  WDTE=0.0058*PI*DDTE*XLTHR
  WGG= 5.55E-4*WDDTE**0.523*PCCHAMB**1.27
  WSC=3.*WDDTGG
  WTP= WTURR + WPOX + WPF + WDTE + WGG + WSC
C
C***  TURBO-PUMP WEIGHT
C      IF (IPSM.GT.0) WRITE(6,FULPMP)
C
  CLOM=0.370*WDDTOF**0.3907
  TLOM=CLOM*PTOX/8.E4
  IF (TLOM.LT.0.02) TLOM=0.02
  WFUEL=WPEST-WOX
  VOLFT=1.05*WFUEL*1728./RHOF
  XLCFT=4.0*VOLFT/(PI*DCASE**2)
  XLLOM=XLCFT
  ALOM=PI*DLOM
  WLOM=0.283*TLOM*XLLOM*ALOM
  DLFM=0.4499*WDDTF**0.375
  DLOI=0.370*WDDTOE**0.3907

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R0CL3440
R0CL3450
R0CL3460
R0CL3470
R0CL3480
R0CL3490
R0CL3500
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R0CL3960
R0CL3970
R0CL3980

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DATA TLOL=PTOX*DLOL/8.E4	ROCL3990
DATA IF(TLOL.LT.0.02) TLOL=0.02	ROCL4000
DATA XLLOL=24.	ROCL4010
DATA ALOL=PI*DLOL	ROCL4020
DATA WLOL=0.283*TLOL*XLLOL*ALOL	ROCL4030
DATA DLF=0.4499*WDOTFE**0.375	ROCL4040
DATA TLFL=DLF*PTF/8E4	ROCL4050
DATA IF(TLFL.LT.0.02) TLFL=C.02	ROCL4060
DATA XLFL=24.	ROCL4070
DATA ALFL=PI*DLFL	ROCL4080
DATA WLFL=0.283*TLFL*XLFL*ALFL	ROCL4090
DATA DLOH=0.370*WDOTDF**0.3907	ROCL4100
DATA TLOH=DLOH*PTOX/8E4	ROCL4110
DATA IF(TLOH.LT.0.02) TLOH=0.02	ROCL4120
DATA XLLOH=24.	ROCL4130
DATA ALOH=PI*DLOH	ROCL4140
DATA WLOH=0.283*TLOH*XLLOH*ALOH	ROCL4150
DATA DLFH=0.4499*WDOTFE**0.375	ROCL4160
DATA TLFH=DLFH*PTPF/8E4	ROCL4170
DATA IF(TLFH.LT.0.02) TLFH=C.02	ROCL4180
DATA XLFH=24.	ROCL4190
DATA ALFH=PI*DLFH	ROCL4200
DATA WLFH=0.283*TLFH*XLFH*ALFH	ROCL4210
DATA DLOGG=0.370*WDOTDG**0.397	ROCL4220
DATA TLOGG=TLOH	ROCL4230
DATA ALGG=PI*DLOGG	ROCL4240
DATA XLLOGG=12.	ROCL4250
DATA WLOGG=0.283* TLOGG * ALGG * XLLOGG	ROCL4260
DATA DLEGG=0.4499* WDOTEG**0.397	ROCL4270
DATA TLEGG=TLOGG	ROCL4280
DATA ALFEGG=PI*DLEGG	ROCL4290
DATA XLEGG=12.	ROCL4300
DATA WLEGG=0.283*TLEGG * XLEGG * ALFEGG	ROCL4310
DATA WLM=10.	ROCL4320
DATA WVFD=0.282	ROCL4330
DATA WVFF=0.230	ROCL4340
DATA WVTD=0.44*DLOM**1.5	ROCL4350
DATA WVIF=0.36*DLFM**1.5	ROCL4360
DATA WVTD=1.408 * (PCHAMB/100.):**0.655 * DLOH**1.6	ROCL4370
DATA WVTF=1.152 * (PCHAMB/100.):**0.655 * DLFH**1.6	ROCL4380
DATA PCTERM=(PCHAMB/100.):**0.655	ROCL4390
DATA WVD=1.76 * PCTERM * DLOH**1.6	ROCL4400
DATA WVF=1.44 * PCTERM * DLFH**1.6	ROCL4410
DATA WVGGO= 1.408 * PCTERM * DLOGG**1.6	ROCL4420
DATA WVGGF= 1.152 * PCTERM * DLEGG**1.6	ROCL4430
DATA WLW = WLOM + WLOL + WLFL + WLOH + WLFH + WLOGG + WLEGG + WLM	ROCL4440
DATA 1 + WVFD + WVFF + WVTD + WVIF + WVTO + WVTF + WVD + WVF + WVGGO	ROCL4450
DATA 2 + WVGGF	ROCL4460
DATA IF(IPSM.GT.0) WRITE(6,VANDL)	ROCL4470
C**** COMPUTE TANK WEIGHT--(INPUT WEIGHT OPTION)	ROCL4480
DATA DTANK = DCASE * TERAC	ROCL4490
C****METAL=1, ALUMINUM, SIGMTL=68000 PSI, RHOMTL=0.1 LB/IN3	ROCL4500
C****METAL=2, TITANIUM, SIGMTL=160000 PSI, RHOMTL=0.167 LB/IN3	ROCL4510
C****METAL=3, STEEL , SIGMTL=220000 PSI, RHOMTL=0.290 LB/IN3	ROCL4520
DATA GO TO (40, 50, 60),METAL	ROCL4530

40 SIGMTL=68000.	RHOMTL=0.1	E=10.47E6	GO TO 70	RDCL4540
50 SIGMTL=160000.	RHOMTL=0.167	E=15.89E6	GO TO 70	RDCL4550
60 SIGMTL=220000.	RHOMTL=0.29	E=28.86E6		RDCL4560
70 TC=2.725*DTANK/E**0.4	IF (IWTANK .LT. 0) TC = TCW	IF (IWTANK .GT. 0) TC = PTOX * 0.5 * DTANK * SAFAC / SIGMTL	IF(TC.LT.0.03) TC=0.03	RDCL4570
	REF2=REF*REF	TERMJ=(REF + SQRT(REF2-1.))/(REF- SQRT(REF2 -1.))	TERMK=0.3925/(REF*SQRT(REF2-1.))	RDCL4580
	SH= DTANK**2*(0.7854 + TERMK*ALOG(TERMJ))	WSH=SH*TC	*RHOMTL	RDCL4590
	TERML=(0.5*DTANK -TC	-0.03)**2	TERMM=(0.5*DTANK/REF -TC	RDCL4600
	-0.03)*PI*0.667	XLH=DTANK*0.5/REF	VOLHD=TERML*TERMM	RDCL4610
	RHOP=	(1.0 + XMRT)/(XMRT/RHOOX + 1.0/RHOF)/1728.	RTI = 0.5 * DTANK - TC - 0.03	RDCL4620
	ATI = PI * RTI**2	XR = XMRT * RHOF / RHOOX	VOLHD2 = 2. * VOLHD	RDCL4630
	RHOOX = PHZX / 1728.	RHOF = RHZF / 1728.	IF (TEPAC .LT.1.) GO TO 4000	RDCL4640
	DMISS = DTANK	TMISS = TC	WSKINP = 0.	RDCL4650
	GO TO 4010			RDCL4660
4000 DMISS = DCASE	TMISS = TSKINI	WSKINP = DCASE * PI * TSKINI * RHOMTL		RDCL4670
4010 IF (ISIZ .EQ.1) GO TO 5000	WDOTG= 3.99E-6* PTOX *(3500.0/(3500.0 - PTOX)) * WDCTE/RHOP	DGL= 1.236 * WDOTG**0.414	WREC= 1.5 * DGL**2	RDCL4680
	WV= 0.5	WSV= 0.4 * DGL**1.5	WCV= 0.5	RDCL4690
	WRV= 1.5 * DGL**1.6	WGL= 1.0	WPSMF= WREG + WV + WSV + 2.0*WCV + 2.0*WRV + WGL	RDCL4700
C*** PRESSURIZATION SYSTEM MISCELLANEOUS EQUIPMENT WEIGHT***	XLFS = 0.5 * DMISS / REF	AFS = DMISS * PI * XLFS	WFS = AFS * TMISS * RHOMTL	RDCL4710
	XIAS = XLFS + DMISS + 9.	AAS = PI * DMISS * XIAS		RDCL4720
				RDCL4730
				RDCL4740
				RDCL4750
				RDCL4760
				RDCL4770
				RDCL4780
				RDCL4790
				RDCL4800
				RDCL4810
				RDCL4820
				RDCL4830
				RDCL4840
				RDCL4850
				RDCL4860
				RDCL4870
				RDCL4880
				RDCL4890
				RDCL4900
				RDCL4910
				RDCL4920
				RDCL4930
				RDCL4940
				RDCL4950
				RDCL4960
				RDCL4970
				RDCL4980
				RDCL4990
				RDCL5000
				RDCL5010
				RDCL5020
				RDCL5030
				RDCL5040
				RDCL5050
				RDCL5060
				RDCL5070
				RDCL5080

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WAS = AAS * TMISS * RHOMTL
WSKINM = PI * DMISS * TMISS * XOLMIS * RHOMTL
WSUM= WPL +WASURF+ WMISCL + WTC + WTP + WLV + WPSMF + WFS + WAS
WSUM = WSUM + WSKINM
IF (ITANK .EQ. 2) GO TO 4020
FGGT= 3.99E-6*PTOX *(3500.0/(3500.0-PTOX)) * (1.0 + 1.188E6
1* RHOMTL/ SIGMTL)
XLC=(WVEH - WSUM - 3.0*WSH -(2.0*VOLHD - SH*TC )*
1 (0.952* RHOP + FGGT) - 3.14E-3*SH)/ (PI * RTI**2*
2 (0.952* RHOP + FGGT) +1.57E-3*PI*(DTANK - 2.0*TC)
3 + 1.05*PI*TC*DTANK*RHOMTL)
IF(XLC.LE.0.0) GO TO 958
VC= RTI**2 *PI * XLC
VT= VC + 2.0*VOLHD -SH*TC
WSC= 1.05 * PI * TC * DTANK * RHOMTL * XLC
WR= 3.14E-3*SH + 1.57E-3*(DTANK -2.0*TC)*PI*XLC
WTANK= 3.0*WSH + WSC + WR
XLTKANK=XLC + 2.*XLH
GO TO 6000
4020 XLMS = 2. * XLFS + DBT
AMS = PI * DMISS * XLMS
WMS = AMS * TMISS * RHOMTL
WSUM = WSUM + WMS
FGGT =3.99E-6*PTOX*3500./ (3500.-PTOX)*(1.+1.118E6*PHOMTL/SIGMTL)
ZC1 = C1
ZC2 = C2
ZC3 = C3
C2 = .00075*(DTANK-2.*TC) + 1.05*PI*TC*DTANK*RHOMTL + WSKINP
C1 = ATI * (.952 * RHOOX + FGGT) + C2
C2 = ATI * (.952 * RHOF + FGGT) + C2
C3 = WVEH-WSUM-4.*WSH-VOLHD2*(.952*(RHOOX+RHOF)+2.*FGGT)-.003*SH
XLCF =(C3 - C1/ATI * VOLHD2 *(XR-1.))/(C1*XR + C2)
XLCO = ((XLCF*ATI + VOLHD2)*XR - VOLHD2) / ATI
XLCOX = XLCO
VCO = ATI * XLCO
VCF = ATI * XLCF
VTO = VCO + VOLHD2
VTF = VCF + VOLHD2
VT = VTO + VTF
WSCF = 1.05 * PI * TC * DTANK * RHOMTL
WSCO = WSCF * XLCO
WSCF = WSCF * XLCF
WPF = .00075*(DTANK - 2.*TC)*PI
WPO = .0015 * SH + WBF * XLCO
WPF = .0015 * SH + WBF * XLCF
WTO = 2. * WSH + WSCO + WBO
WTF = 2. * WSH + WSCF + WBF
WTANK = WTO + WTF
XLTO = XLCO + 2. * XLH
XLTF = XLCF + 2. * XLH
XLTKANK = XLTO + XLTF
IF (IPSM .GT. 0 ) WRITE ( 6, TANK3 )
C1 = ZC1
C2 = ZC2
C3 = ZC3

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POCL5090
POCL5100
POCL5110
POCL5120
POCL5130
POCL5140
POCL5150
POCL5160
POCL5170
POCL5180
POCL5190
POCL5200
POCL5210
POCL5220
POCL5230
POCL5240
POCL5250
POCL5260
POCL5270
POCL5280
POCL5290
POCL5300
POCL5310
POCL5320
POCL5330
POCL5340
POCL5350
POCL5360
POCL5370
POCL5380
POCL5390
POCL5400
POCL5410
POCL5420
POCL5430
POCL5440
POCL5450
POCL5460
POCL5470
POCL5480
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POCL5520
POCL5530
POCL5540
POCL5550
POCL5560
POCL5570
POCL5580
POCL5590
POCL5600
POCL5610
POCL5620
POCL5630

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GO TO 6000	ROCL5640
5000 CONTINUE	ROCL5650
C*** TANK WEIGHT--LENGTH INPUT OPTION***	ROCL5660
XL TAPP=XL VEH - XL THR -DTURB -11.0 - XOLMIS	ROCL5670
XLH= DTANK*0.5/RFH	ROCL5680
VOLHD = 0.6667 * ATI * (XLH - TC - .03)	ROCL5690
VOLHD2 = 2.*VOLHD	ROCL5700
KOUNT=0	ROCL5710
WSKINM=PI*DMISS*TMISS*XOLMIS*RHOMTL	ROCL5720
IF (ITANK .EQ. 1) GO TO 8888	ROCL5730
XLCOX= (((XL TAPP-4.*XLH)*ATI+VOLHD2)*XR - VOLHD2) / (ATI*(1.+XR))	ROCL5740
XLCF = XL TAPP - XLCOX- 4. * XLH	ROCL5750
HN = 4.	ROCL5760
XLMS = 2. * XLH + DBT	ROCL5770
AMS = PI * DMISS * XLMS	ROCL5780
WMS = AMS * TMISS * RHOMTL	ROCL5790
WSKINM = PI * DMISS * TMISS * XOLMIS * RHOMTL	ROCL5800
5010 XLC = XLCOX+ XLCF	ROCL5810
VT0 = VOLHD2 + ATI * XLCOX	ROCL5820
VTF = VOLHD2 + ATI * XLCF	ROCL5830
VT=VT0 + VTF	ROCL5840
GO TO 5020	ROCL5850
5015 IF (ITANK .EQ. 1) GO TO 8789	ROCL5860
XLCOX= (((XL TANK-4.*XLH)*ATI+VOLHD2)*XR - VOLHD2) / (ATI*(1.+XR))	ROCL5870
XLCF = XL TANK - XLCOX- 4. * XLH	ROCL5880
GO TO 5010	ROCL5890
8888 XLC= XL TAPP - 2.0*XLH	ROCL5900
HN = 3.	ROCL5910
GO TO 8889	ROCL5920
8789 XLC=XL TANK-2.*XLH	ROCL5930
IF(XLC.LE.0.C) GO TO 998	ROCL5940
8889 VT= 2.0*VOLHD + RTI**2 * PI * XLC - SH*TC	ROCL5950
5020 WGAS= 3.99E-6 * PTOX * (3500.C/(3500.0 -PTOX))*VT	ROCL5960
VGT= 100.0 * WGAS	ROCL5970
DGT= (6.0 * VGT/PI)**0.333	ROCL5980
IF(KOUNT.GT.0) GO TO 8890	ROCL5990
XL TANK= XL TAPP - DGT	ROCL6000
GO TO 8891	ROCL6010
8890 XL TANK=XL TAPP-DGT	ROCL6020
8891 IF(KOUNT.GT.10) GO TO 998	ROCL6030
XL TAPP=XLC + 2.*XLH + DGT	ROCL6040
IF(ITANK.EQ.2) XL TAPP=XLC + 4.*XLH + DGT	ROCL6050
IF(IPSM.GT.0) WRITE(6,BUG)	ROCL6060
KCUNT=KCUNT + 1	ROCL6070
IF(ABS(XL TAPP - XL TAPP).GT.0.5)GO TO 5015	ROCL6080
XL TANK=XL TAPP-DGT	ROCL6090
89 CONTINUE	ROCL6100
WSH= 1.05 * RHOMTL * TC * SH	ROCL6110
WSC= 1.05 * PI * TC * DTANK * RHOMTL * XLC	ROCL6120
WP= 3.14E-3*SH + 1.57E-3*(DTANK -2.0*TC) *PI * XLC	ROCL6130
WTANK = HN * WSH + WSC + WB	ROCL6140
XLFS= XLH	ROCL6150
AFS = PI * DMISS * XLFS	ROCL6160
WFS = AFS * TMISS * RHOMTL	ROCL6170
XLAS = XLFS + DMISS + 9.	ROCL6180

AAS = PI * DMIS * XLAS	RDCL6100
WAS = AAS * TMISS * RHOMTL	RDCL6200
6000 CONTINUE	RDCL6210
WGAS = 3.99E-6 * VT * PTOX * (3500.0 / (3500.0 - PTOX))	RDCL6220
VGT = 100.0 * WGAS	RDCL6230
DGT = (6.0 * VGT / PI) ** 0.333	RDCL6240
WGT = 1.188E6 * RHOMTL * WGAS / SIGMTL	RDCL6250
WDOTG = 3.99E-6 * PTOX * (3500.0 / (3500.0 - PTOX)) * WDOTC / RHCP	RDCL6260
DGL = 1.236 * WDOTG ** 0.414	RDCL6270
WREG = 1.5 * DGL ** 2	RDCL6280
WFEV = 0.5	RDCL6290
WSV = 0.4 * DGL ** 1.5	RDCL6300
WCV = 0.5	RDCL6310
WPV = 1.5 * DGL ** 1.6	RDCL6320
WGL = 1.0	RDCL6330
WPSMF = WREG + WFEV + WSV + 2.0 * WCV + 2.0 * WRV + WGL	RDCL6340
WPS = WGAS + WGT + WPSMF	RDCL6350
IF (ITANK .EQ. 2) GO TO 5050	RDCL6360
VP = 0.952 * VT	RDCL6370
WP = VP * RHCP	RDCL6380
WCX = XMRT * WP / (XMRT + 1.)	RDCL6390
GO TO 5055	RDCL6400
5050 WCX = .952 * VT * RHOOX	RDCL6410
WF = .952 * VTF * RHOF	RDCL6420
WP = WCX + WF	RDCL6430
5055 WPROPI = WTC + WTP + WLW + WTANK + WPS + WAS + WFS + WMISCL	RDCL6440
WPROPI = WPROPI + WSKINM + WMS	RDCL6450
WPROPS = WPROPI + WP	RDCL6460
WVEH = WPL + WASURE + WPROPS	RDCL6470
IF (ITHR .EQ. 1) GO TO 5060	RDCL6480
TOW = FHI / WVEH	RDCL6490
GO TO 5065	RDCL6500
5060 TOW = FHI / WVEH	RDCL6510
TOWERR = TOWDES - TOW	RDCL6520
IF (ABS(TOWERR) .LE. 0.1) GO TO 5065	RDCL6530
5075 FHI = TOWDES * WVEH	RDCL6540
FLO = FHI / TRATIO	RDCL6550
IF (IPSM .GT. 0) WRITE(6, TOWPR)	RDCL6560
KCNT = KCNT + 1	RDCL6570
IF (KCNT .GT. 10) GO TO 998	RDCL6580
GO TO 12	RDCL6590
5065 CONTINUE	RDCL6600
IF (IPSM .GT. 0) WRITE(6, TOWPR)	RDCL6610
WPOVW = WP / WVEH	RDCL6620
PMF = WP / WPROPS	RDCL6630
XIME = WPROPI / WPROPS	RDCL6640
TOTIMH = WP * ENGISP	RDCL6650
TPURNH = TOTIMH / FHI	RDCL6660
TOTIML = WP * XISPLD	RDCL6670
TPURNL = TOTIML / FLO	RDCL6680
IF (IPSM .GT. 0) WRITE(6, TANKW2)	RDCL6690
IF (IPSM .GT. 0) WRITE(6, TANKW1)	RDCL6700
IF (IPSM .GT. 0) WRITE(6, TANK3)	RDCL6710
C*** THRUST CHAMBER AND TURBOPUMP CENTER OF GRAVITY***	RDCL6720
IF (ITANK .EQ. 2) GO TO 5031	RDCL6730

	DRTX = 0.	ROCL6740
	GO TO 5032	ROCL6750
5031	DRTX = DRT	ROCL6760
5032	XLPS=DGT + XLTANK + DTURB + XLTHR + 11. + DBTX	ROCL6770
	XLPS = XLPS + XOLMIS	ROCL6780
	RTLQ = XLTHR + XLH + DTURB + 9.	ROCL6790
	IF(XLTP.GT.DCASE) XLPS=DGT + XLTANK + XLTHR + XLTP + 11.	ROCL6800
1	+ XOLMIS + DBTX	ROCL6810
	XTOTAL=XLPAYI + XLPS	ROCL6820
	RT=0.5*DTHRT	ROCL6830
	XIN1=DTHRT * PBELL *(SQRT(EPS1)-1.)/53.6	ROCL6840
	DEXIT=DET	ROCL6850
	XIN2=XINT - XIN1	ROCL6860
	ZBARN2 = XLPS - (XIN2/3.0)*((3.8148*RT + DEXIT)/(1.9074*RT +DEXIT))	ROCL6870
	DEP1= SQRT(EPS1)*DTHRT	ROCL6880
	ZBARN1= XLPS - XIN2 -(XIN1/3.)*((3.8148*RT + DEP1)/(1.9074	ROCL6890
	1*RT + DEP1))	ROCL6900
	ZBARC2= XLPS- XIN2 - XIN1 - XLC2T*(1.0 - 0.3333* (3.37*RT + DCT)	ROCL6910
1	/(1.685*RT + DCT))	ROCL6920
	ZBARC1= XLPS - XIN2 - XIN1 - XLC2T - 0.5*XLC1T	ROCL6930
	ZPARJ= DGT + XLTANK + DTURB + XLJT*0.5 + 11.	ROCL6940
	UMTY = ZBARC1 * WC1T	ROCL6950
	ZPARTC = (ZBARN2*WN2T + ZBARN1*WN1T + ZBARC2*WC2T + UMTY	ROCL6960
1	+ ZBAPJ*WINJ)/WTC	ROCL6970
	ZPARTP= 0.5*DTURB + XLTANK + DGT + 7.	ROCL6980
	WF= WP- WOX	ROCL6990
	IF (ITANK .EQ. 2) GO TO 5030	ROCL7000
	XLCOX=(WOX/(0.95*RHOOX) - 2.*VOLHD)/(PI*RTI**2)	ROCL7010
	XLTOX= XLCOX + XLH	ROCL7020
	XLTF= XLTANK - XLTOX	ROCL7030
	GO TO 5035	ROCL7040
5030	XLTF = XLCF + 2. * XLH	ROCL7050
	XLTOX = XLCOX + 2. * XLH	ROCL7060
5035	ZPAROS= 0.5*XLTANK +DGT + 2.	ROCL7070
	ZPARMH= 0.25*DTANK/REH - 0.25*TC + XLTOX + DGT + 2.	ROCL7080
	WTOS=WTANK-WSH	ROCL7090
	ZPART=(WTOS*ZBAROS + WSH* ZBARMH)/WTANK	ROCL7100
	ZBARPS= 0.5*DGT	ROCL7110
	ZBAROX= 0.5*XLTOX + DGT + 2.	ROCL7120
	ZBARF = 0.5*XLTF + 0.25*DTANK/REH + XLTOX + DGT + 2. + DBTX	ROCL7130
	WOXTNK=1.05*PI*DTANK*RHOMTL*XLCOX*TC + 2.*WSH	ROCL7140
	WETANK=WTANK-WOXTNK	ROCL7150
	IF (IPSM .GT. 0) WRITE (6, TCTPCG)	ROCL7160
	ZLOM=DGT + 2. + XLTOX + 0.5*XLTF	ROCL7170
	ZLOL=XLPS - XLTHR -4.0 - DTURB	ROCL7180
	ZLFL= ZLOL	ROCL7190
	ZLOH= XLPS - 0.5*(XLTHR-6.)	ROCL7200
	ZLFH=XLPS -XLTHR -4.	ROCL7210
	ZLOGG = ZLFH	ROCL7220
	ZLFGG=ZLOGG	ROCL7230
	ZLM=ZLOGG	ROCL7240
	ZVFO= XLPS - XLTHR - DTURB -2.	ROCL7250
	ZVFF=ZVFO	ROCL7260
	ZVIO=XLPS - XLTHR - XLTURB -8.	ROCL7270
	ZVIF=ZVIO	ROCL7280

ZVTD=XLPS - XLTHP	ROCL7290
ZVTF=ZVTD	ROCL7300
ZVO=XLPS - XLTHP -2.	ROCL7310
ZVF=ZVO	ROCL7320
ZVGGD=XLPS - XLTHP -2.	ROCL7330
ZVGGF=ZVGGD	ROCL7340
ZPARMS = DGT + 2. + XLTANK + .5 * XOLMIS	ROCL7350
XMOME=ZPARTC*WTC + ZBARTP*WTP + ZBART*WTANK + ZPARPS*WPS	ROCL7360
1 + ZLOM*WLQM + ZLOL*WLQL + ZLFL*WLFL + ZLOH*WLOH + ZLFH*WLFH	ROCL7370
2 + ZLOCC*WLCCG + ZLEGG*WLEGG + ZLM*WLM + ZVFO*WVFO +	ROCL7380
3 ZVFF*WVFF + ZVIO*WVIO + ZVIF*WVIF + ZVTO*WVTO + ZVTF*WVTF	ROCL7390
4 + ZVO*WVO + ZVF*WVF + ZVGGD*WVGGD + ZVGGF*WVGGF	ROCL7400
5 + ZPARMS*WMSCL + ZPARMS * WSKINM	ROCL7410
XMOMLV=XMOME-(ZPARTC*WTC + ZBARTP*WTP + ZBART*WTANK + ZPARPS*WPS)	ROCL7420
XCGLV=XMOMLV/WLV	ROCL7430
XCCF=XMOME/WPROPI	ROCL7440
XCGF=(XMOME + ZBAROX*WOX + ZBARF*WF)/WPROPS	ROCL7450
XXLPS = XLPS	ROCL7460
IF (IPSM .EQ. 0) GO TO 999	ROCL7470
IF (IPSM.GT.0) WRITE(6,VLCG)	ROCL7480
CALL PAGE	ROCL7490
WRITE(6,6110)	ROCL7500
6110 FORMAT(//10X,31H LIQUID ROCKET DESIGN PARAMETERS)	ROCL7510
IF (IS17.LE.1) GO TO 60C1	ROCL7520
5900 FORMAT(/9X,14HTANK DIAMETER=,F5.2,4H IN.,4X,19HWEIGHT INPUT OPTION	ROCL7530
1,3X,15HVEHICLE WEIGHT=,F10.3,4H LB.)	ROCL7540
GO TO 60C2	ROCL7550
60C1 CONTINUE	ROCL7560
5800 FORMAT(/9X,14HTANK DIAMETER=,F5.2,4H IN.,4X,19HLENGTH INPUT OPTION	ROCL7570
1,3X,15HVEHICLE LENGTH=,F10.3,4H IN.)	ROCL7580
60C2 IF (ITHP.NE.0) GO TO 6050	ROCL7590
60C0 FORMAT(/9X,20HDESIGN THRUST TO WEIGHT RATIO=,F6.2,5X,15HTHRITTLE	ROCL7600
LATIO=,F6.2)	ROCL7610
GO TO 60C2	ROCL7620
6050 WRITE(6,6090)FDES,TOW	ROCL7630
6050 FORMAT(/9X,14HDESIGN THRUST=,F10.2,4H LBF,4X,23HTHRUST TO WEIGHT	ROCL7640
LATIO=,F6.2)	ROCL7650
60C2 WRITE(6,6100)	ROCL7660
6100 FORMAT(/2X,51HCOMPONENT DIA-IN. LT-IN. WT-LB. CG LCC-IN.)	ROCL7670
WRITE(6,6200)DGT,XLCIT,WGIT,ZBARCL	ROCL7680
6200 FORMAT(/3X,1CHTR CYL. ,F6.2,4X,F6.2,3X,F8.2,5X,F6.2)	ROCL7690
WRITE(6,6300)DGT,XLTHP,WTC,ZBARTC	ROCL7700
6300 FORMAT(/ 4X,9HTHRUSTER ,F6.2,4X,F6.2,3X,F8.2,5X,F6.2)	ROCL7710
WRITE(6,6400)DTURP,XLTP,WTP,ZBARTP	ROCL7720
6400 FORMAT(/4X,9HTURBO-PP ,F6.2,4X,F6.2,3X,F8.2,5X,F6.2)	ROCL7730
WRITE(6,6500)WLV,XCGLV	ROCL7740
6500 FORMAT(/4X,9HPLUMBING ,19X,F8.2,5X,F6.2)	ROCL7750
WRITE(6,6600)DTANK,XLTANK,WTANK,ZBART	ROCL7760
6600 FORMAT(/4X,8HTANKAGE ,F6.2,4X,F6.2,3X,F8.2,5X,F6.2)	ROCL7770
WRITE(6,6700)DGT,DGT,WPS,ZBARPS	ROCL7780
6700 FORMAT(/4X,9HPRESS SY ,F6.2,4X,F6.2,3X,F8.2,5X,F6.2)	ROCL7790
WRITE(6,6800)DTANK,XLTOX,WXOTNK,ZBAROX	ROCL7800
6800 FORMAT(/4X,9HIX TANK ,F6.2,4X,F6.2,3X,F8.2,5X,F6.2)	ROCL7810
WRITE(6,6900)DTANK,XLTF,WFTANK,ZBARF	ROCL7820
6900 FORMAT(/4X,9HFUEL TANK,F6.2,4X,F6.2,3X,F8.2,5X,F6.2)	ROCL7830

	WRITE(6,7000)DTANK,XLTOX,WOX,ZBARCX	RDCL 7840
7000	FORMAT(/4X,9HOXIDIZER ,F6.2,4X,F6.2,3X,F8.2,5X,F6.2)	RDCL 7850
	WRITE(6,7100)DTANK,XLTF,WF,ZBARF	RDCL 7860
7100	FORMAT(/4X,9HFUEL ,F6.2,4X,F6.2,3X,F8.2,5X,F6.2)	RDCL 7870
	WRITE(6,7200)DCASE,XOLMIS,WMISSL,ZBARMS	RDCL 7880
7200	FORMAT(/4X,9HMISC ,F6.2,F10.2,2F11.2)	RDCL 7890
	WRITE(6,7300)DCASE,XLPS,WPROPI,XCGE	RDCL 7900
7300	FORMAT(/4X,9HENGINE ,F6.2,4X,F6.2,3X,F8.2,5X,F6.2)	RDCL 7910
	WRITE(6,7400)DCASE,XTOTAL,WVEH	RDCL 7920
7400	FORMAT(/4X,9HVEHICLE ,F6.2,4X,F6.2,3X,F8.2)	RDCL 7930
	WRITE(6,7600)	RDCL 7940
7600	FORMAT(/40X,36H LIQUID ROCKET PERFORMANCE PARAMETERS)	RDCL 7950
	WRITE(6,7700)	RDCL 7960
7700	FORMAT(/3X,89HMAX THR MIN THR ISPMAX ISPMIN PCMAX PCMIN	RDCL 7970
	1 ITOTMAX ITOTMIN TBMAX TBMIN)	RDCL 7980
	WRITE(6,7800)FHI,FLO,ENGISP,XISPLO,PCHAMB,PCHLO,TOTIMH,TOTIML,	RDCL 7990
	ITURNH,TURNL	RDCL 8000
7800	FORMAT(2X,F8.2,2X,F8.2,3X,F6.2,3X,F6.2,2X,F7.2,1X,F7.2,1X,F10.2,	RDCL 8010
	1 2XF10.2, 2X,F6.2, 2X,F8.2)	RDCL 8020
	GO TO 999	RDCL 8030
998	KFAIL=1	RDCL 8040
	WRITE(6,7500)	RDCL 8050
7500	FORMAT(/40X,42H CYLINDER LENGTH EQUAL TO OR LESS THAN ZERO)	RDCL 8060
999	CONTINUE	RDCL 8070
	WFX=WF	RDCL 8080
	WPX=WP	RDCL 8090
	WTPX=WTP	RDCL 8100
	METALX=METAL	RDCL 8110
	FMAX=FHI	RDCL 8120
	WT=WOXTNK + WFTANK	RDCL 8130
	WO = WOX	RDCL 8140
	WSC = 3. * WDOTGG	RDCL 8150
	WSECT = WSKINP * XLTANK	RDCL 8160
	FHIS=FHI	RDCL 8170
	RPODX = RHZX	RDCL 8180
	RPOF = RHZF	RDCL 8190
	RETURN	RDCL 8200
	END	RDCL 8210
	SUBROUTINE EXB00(APE2,PL,MP,MPMF,LT,SGWT,KFAIL)	EXB00010
C	COMPUTE EXTERNAL BOOSTERS FOR LIQ/SOL/TJ.....WT OPTION ONLY.....	EXB00020
	REAL NOZWTX,MPX	EXB00030
	COMMON /COMVLS/ COM(51)	EXB00040
	EQUIVALENCE (COM(16),WMC),	EXB00050
	1 (COM(17),VBI),	EXB00060
	2 (COM(18),DTHRT),	EXB00070
	3 (COM(19),RNOZI),	EXB00080
	4 (COM(20),NOZWTX),	EXB00090
	5 (COM(21),MPX),	EXB00100
	6 (COM(22),CASEMX),	EXB00110
	7 (COM(32),WM)	EXB00120
C	COMMON /BESYET/ FACTOR, BES14(14)	EXB00130
		EXB00140

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COMMON /PRINTR/ IPSM, IPCL6(6)
EQUIVALENCE ( IPSM, IPRINP, NOUT )
COMMON /TOVPER/ BCOWP,BISPV,BTHVAC,BEXIT,SUSWP,SEXIT,BCANTA,
1 WTINIT,DROPST,DROPER,KIZ,ZA4(4),EXTRA(57)
COMMON /MATTP/ IR(3)
COMMON /ARRAY/ F,PC,PAP,CF,CFB,ISP,TB
COMMON /GOBOL/ WARD(78)
COMMON /CODEBT/ IFIRST,JRJ,J
COMMON /INSERT/ WG,WA,WTB,WC,WTI,DELA,PE,X1,XG,XI,WRN,EPSC,
1 A6A3,A5A3,Y1,RC, AT,XRN,TIEC,RE,RECHK,FI,CFVA, TTH,
1 THED,ICG,X3,Z1,XA,LN,TAH,NOZWT,ISPV
REAL ISP,N1,N2,N3,N4, N9,N10,N11,N13, A21,A22,A23
1 N24, N30,N33,N34,N35,N36,N37,N38,N39,N40,
2 N77,N78,N79,N80,N81,N82,N83,N84,N85,N114,N115,N117,
3 N119,N120,N121,LN,LT, LCYL,MPFH,MPAH,MPCYL,MP,MPA,MEFSTR,
4 INSUL,LINER,IBOSS,NBOSS,ML,IGNITR,MEMSTC,MEFSTA,INSULA,
5 INSRRG,NOZWT, ME, MB, MOC, MMF,MPMF,ITOT, IMPWT,ISPV
COMMON /NOZMP/ CZ1(28),7NOZ,XINQZ
EQUIVALENCE
1(WARD( 1),D ),(WARD( 3),FJ ),(WARD( 4),PA ),
2(WARD( 5),FI ),(WARD( 6),PBELL ),(WARD( 7),PHI ),
3(WARD( 8),GAM ),(WARD( 9),RHOP ),(WARD(11),CSTAR ),
4(WARD(12),PCM ),(WARD(13),FSYLD ),(WARD(14),FSULT ),
5(WARD(15),TMIN ),(WARD(16),TCASEF),(WARD(17),RFX ),
6(WARD(18),CASEM ),(WARD(19),DM ),(WARD(20),FTAX ),
7(WARD(21),DI FS ),(WARD(23),N1 ),(WARD(24),N2 ),
8(WARD(25),N3 ),(WARD(26),N4 ),(WARD(27),N114 ),
9(WARD(28),N5 ),(WARD(29),N10 ),(WARD(30),N11 ),
X(WARD(31),N13 ),(WARD(32),VRFH ),(WARD(33),N34 )
EQUIVALENCE
1(WARD(34),N35 ),(WARD(35),N36 ),(WARD(36),N37 ),
2(WARD(37),N38 ),(WARD(38),N39 ),(WARD(39),N40 ),
3(WARD(40),GMAX ),(WARD(41),N22 ),(WARD(42),N23 ),
4(WARD(43),N24 ),(WARD(44),N33 ),(WARD(45),N115 ),
5(WARD(46),N117 ),(WARD(47),FMPAH ),(WARD(48),N30 ),
6(WARD(49),N21 ),(WARD(50),N77 ),(WARD(51),N78 ),
7(WARD(52),N79 ),(WARD(53),N80 ),(WARD(54),N81 ),
8(WARD(55),N82 ),(WARD(56),N83 ),(WARD(57),N84 ),
9(WARD(58),N85 ),(WARD(59),N121 ),(WARD(61),EPI ),
X(WARD(62),PSUR ),(WARD(63),RHC )
NAMELIST /RADPUN/ A5A3,A6A3, MOC, ME,MPCYL,MPAH,MPFH,ISPV,
INQZWT,FIMOC,FIMO,DELVR,SDVI,LCYL,AT,LOOP1,LOOP2
NAMELIST /BUGBDD/ FACTOR,A,B, WARD
12 FORMAT (//10X17HPROBLEM STOP NO. 12,15H HAS OCCURRED. )
AFAT = WARD(10)
TTH= WARD(22)*.01745329

PI = 3.141593
TIFC = 0.
IFX = 1
J = -1
IFIRST = 1
PETA = RFX * .01745329
ML=PL/FACTOR
EXTWT = 0.

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TR = 5.	EXR00700
IF (IFIRST.LT.1) GO TO 660	EXR00710
PSUB = 1.0	EXR00720
IF (IPRINP .LE. 1) GO TO 660	EXR00730
IF (IEX.GT.0)WRITE(6,301)	EXR00740
301 FORMAT(17H EXTERNAL BOOSTER)	EXR00750
WRITE(6,652) APF2,ML,A6Z3,A5Z3,PA	EXR00760
652 FORMAT(/35H VALUES OF BOOST CALL LIST / 3X,	EXR00770
1 61H DELTA V PAYLOAD A6A3 A5A3	EXR00780
1P AMB	EXR00790
2 / 3X, 2F10.3,3F10.5,F10.2/)	EXR00800
IF (J) 653,654,653	EXR00810
653 WRITE (6,655)	EXR00820
655 FORMAT(10X23H THRUST TO WEIGHT INPUT /)	EXR00830
GO TO 660	EXR00840
654 WRITE (6,657)	EXR00850
657 FORMAT(10X13H THRUST INPUT /)	EXR00860
660 IND=0	EXR00870
PC = WARD(2)	EXR00880
DELVR = APE2	EXR00890
PAP = PA	EXR00900
IF (PAP .LE. 0) PAP = .0001	EXR00910
6001 PI=3.141593	EXR00920
ISP = (STAR*1.5/32.174	EXR00930
WRATL =DELVR/ISP /32.174	EXR00940
WRAT= 2.71828**WRATL	EXR00950
MP=(WRAT*ML-ML)/(1.2-.2*WRAT)	EXR00960
IF (J) 2200,2202,2200	EXR00970
2202 F = F1	EXR00980
GO TO 2201	EXR00990
2200 F = (1.2 * MP+ML)*F1	EXR01000
2201 TR = MP*ISP/F	EXR01010
IF (GAM -1.0) 30, 30, 35	EXR01020
30 IND = 2	EXR01030
IF (IPRINP .GT. 0) WRITE (6,9002) GAM	EXR01040
9002 FORMAT(42H GAMMA LESS THAN 1 NOT PERMITTED. GAMMA = ,E16.6)	EXR01050
GO TO 22	EXR01060
C TEST TO DETERMINE IF F IS INPUT OR TO BE FOUND BY ITERATION	EXR01070
35 IF (J) 100,95,100	EXR01080
95 F = F1	EXR01090
GO TO 103	EXR01100
100 F1M0 = F1	EXR01110
103 LOOP2 = 1	EXR01120
KKK=0	EXR01130
ICG = 0	EXR01140
FLAMRD=.5*(1.+COS(PHI))	EXR01150
TKEXIT = .25	EXR01160
CI =DM-2.*TKEXIT	EXR01170
EPSC = N23	EXR01180
AMAX =(CI/2.)*2*PI	EXR01190
PP= PC*FSYLD	EXR01200
MCASE= IFIX(CASEM+.1)	EXR01210
CALL MATLS(MCASE,TCASEF,RHO,FTU,FTY,IND)	EXR01220
IF (IND .NE. 0) GO TO 135	EXR01230
TCYLU =FSULT*PC *D /(FTU*2.)	EXR01240

C

TCYLY =FSYLD*PC *D /(FTY*2.)	FXR01250
TCYLT =AMAX1(TCYLU,TCYLY)	FXR01260
TC = AMAX1(TCYLT,TMIN)	FXR01270
A=PI*(D/2. - TC - N117) **2	FXR01280
TAHU =FSULT*PC *N23*D/FTU/4.	FXR01281
TAHY =FSYLD*PC *N23*D/FTY/4.	FXR01290
TAHT =AMAX1(TAHU,TAHY)	FXR01300
TAH =AMAX1(TAHT,TMIN)	FXR01310
IF (N2.FQ. N23) GO TO 136	FXR01320
TFHU =FSULT*PC *N2 *D/FTU/4.	FXR01330
TFHY =FSYLD*PC *N2 *D/FTY/4.	FXR01340
TFHT =AMAX1(TFHU,TFHY)	FXR01350
TFH =AMAX1(TFHT,TMIN)	FXR01360
GO TO 142	FXR01370
136 TFH = TAH	FXR01380
142 LOOP1 = 1	FXR01390
1427 CONTINUE	FXR01400
PEPC = PA/PC	FXR01410
EPS=((GAM+1.)/2.)*((1./(GAM-1.))*(PEPC)**((1./GAM) *	FXR01420
1 SORT ((GAM+1.)/(GAM-1.))*((1. - (PEPC)**((GAM-1.)/GAM)))	FXR01430
EPI = 1./FPS	FXR01440
CFV = FIAMB0 * SQRT(2.*GAM**2/(GAM-1.)*(2./(GAM+1.))*((GAM+1.)/	FXR01450
1(GAM-1.)) * (1.-PEPC**((GAM-1.)/GAM))) +PEPC*EPI	FXR01460
JK = 0	FXR01470
R3 = D/2.0	FXR01480
IF (FPI .LT. 2.5) GO TO 308	FXR01490
CF =(CFV -PA/PC*EPI)*FJ	FXR01500
EPOLD = EPI	FXR01510
ISP= CSTAR*CF/32.174	FXR01520
AT = F/PC/CF	FXR01530
AFXIT=FPI*AT	FXR01540
RF = SQRT (AFXIT/PI)	FXR01550
RT = SQRT (AT/PI)*((1. - 0.4*(1./COS(PHI) -1.))	FXR01560
EXLT =(RF-RT)/TAN(PHI)	FXR01570
DELP = EXLT* TAN(BETA)	FXR01580
REF = (RE+DELR)*COS(BETA)	FXR01590
AEFF =REF**2*PI	FXR01600
IF(AEFF .GT. AMAX*1.001) GO TO 302	FXR01610
312 NROSS = N77 * PP * D*N23*AT	FXR01620
STHRSL= N78 * PP * AT**1.5	FXR01630
XCONE = N79 * PP * AT**1.5*(EPI-2.5)/ SIN(PHI)	FXR01640
INSRRG= N80 * (EPI*AT) **0.5	FXR01650
THININ= N81 * AT **0.9	FXR01660
SUM = PC**N83*TB**N84	FXR01670
XINSUL = N82*AT*(EPI-2.5)/SIN(PHI)*FSYLD**N83*SUM	FXR01680
1 *(CSTAR/32.174)**N85	FXR01690
ACZWT = NROSS + STHRSL + XCONE + INSRRG + THININ + XINSUL	FXR01700
ZNFRNG = 0.	FXR01710
RTH= SQRT(AT/PI)	FXR01720
DN = SQRT(AT*N24/PI)	FXR01730
IF(DN .GE. R3) DN = .8*R3	FXR01740
EY = DN - SQRT(AT/PI)	FXR01750
EYS = EY**2	FXR01760
IF (EYS .GT. AT) EYS = AT - 1.0	FXR01770
	FXR01780

X1 = SQRT(AT-EYS)	EXB01790
Z1 = SQRT((R3**2 -DN**2)/N23**2)	EXB01800
X2 = EXLT*COS(BETA) + (RE + TKEXIT)*SIN(BETA)	EXB01810
XRN = X1 + Z1+X2*PRELL	EXB01820
GO TO 144	EXB01830
308 IND = 9	EXB01840
GO TO 307	EXB01850
304 IND = 10	EXB01860
307 IF (IPRINP .GT. 0) WRITE(6,305) AMAX,AEXIT,AT,EPI	EXB01870
305 FORMAT(28H ERROR CALCULATING EXIT AREA /2X,4E20.6)	EXB01880
GO TO 22	EXB01890
302 RMAX =DI/2.	EXB01900
AA = RMAX/ COS(BETA)	EXB01910
XX = (RMAX-RT/COS(BETA)) /TAN(PHI + BETA)	EXB01920
YY = XX*TAN(BETA)	EXB01930
CLNX = XX + RMAX*TAN(BETA)	EXB01940
DELR = CLNX*YY/XX	EXB01950
RE = AA- DELR-TKEXIT	EXB01960
AEXIT= RE*RE*PI	EXB01970
303 JK = JK + 1	EXB01980
IF (JK .GT.30) GO TO 304	EXB01990
EPI = AEXIT/AT	EXB02000
IF (EPI .LT. 2.5) GO TO 308	EXB02010
IF (ABS(EPOLD/EPI -1.0).LT. .001) GO TO 311	EXB02020
EPOLD = EPI	EXB02030
CALL NOZEX(GAM,EPI,PHI,PEPC,CFV,IND)	EXB02040
PE = PEPC*PC	EXB02050
IF(IND.NE.0) GO TO 9023	EXB02060
GO TO 303	EXB02070
311 RT = SQRT (AT/PI)*(1. - 0.4*(1./COS(PHI) -1.))	EXB02080
XX = (RMAX-RT/COS(BETA)) /TAN(PHI + BETA)	EXB02090
YY = XX*TAN(BETA)	EXB02100
CLNX = XX + RMAX*TAN(BETA)	EXB02110
DELR = CLNX*YY/XX	EXB02120
ISP= CSTAR*CF/32.174	EXB02130
EXLT = CLNX	EXB02140
GO TO 312	EXB02150
143 CONTINUE	EXB02160
144 AGX = PI*(.5*D-TC-N117)**2	EXB02170
AFAT = WARD(10)	EXB02180
APAT = (1.-ETAX)*AGX/AT	EXB02190
IF (APAT.GT.AFAT) AFAT = APAT	EXB02200
CMASS CF PROPELLANT FWD HEAD	EXB02210
MPFH = RHOP *(2.09*(D*.5-TFH-N114)**2 *(.5*D/N2-TFH -N114) -	EXB02220
1 .5*AFAT*AT*D/N2) - RHOP*VRFH	EXB02230
CMASS CF PROPELLANT AFT HEAD	EXB02240
MPAH1=RHOP*(2.09*(D*.5-TAH-N115)**2*(.5*D/N23-TAH-N115))	EXB02250
MPAH = (MPAH1-RHOP*AFAT*AT*(.5*D/N23-TAH-N115))*FMPAH	EXB02260
A = PI*(D/2.-TC-N117)**2	EXB02270
CMASS CF PROPELLANT CYLINDER	EXB02280
MPCYL =MP-MPFH-MPAH	EXB02290
IF(MPCYL) 20C1,20C2,2002	EXB02300
20C1 MPCYL =0.	EXB02310
KKK=KKK+1	EXB02320
20C2 LCYL=MPCYL/(RHOP*(A-AFAT*AT))	EXB02330

	TR = MP*ISP/F	EXR02340
C	FORWARD HEAD WEIGHTS	EXR02350
	IF (N2-1.) 180,175,180	EXR02360
175	MEMSTR = N1*RHO*TFH*(PI*D*D/2.-N3*AT)	EXR02370
	INSUL = N4*N114*1.5708*(D-2.*TFH)**2	EXR02380
	GO TO 185	EXR02390
180	SAY1 = SORT (1.-1./(N2**2))	EXR02400
	SAY = ALOG ((1.+ SAY1)/(1.-SAY1))	EXR02410
	MEMSTR = N1*RHO*TFH*(D**2 * (.7854 + .3925/(N2**2 *SAY1) * 1 SAY) - N3 *AT)	EXR02420
	INSUL=N4*N114*((D-2.*TFH)**2*(.7854+.3925*SAY/SAY1/N2**2)-N3*AT)	EXR02430
185	IBOSS = 4.5*N9*TFH *RHO * AT	EXR02440
	IGNITR = N10 *(LCYL +D/N2)**.01766*(AFAT*AT)**.5 + N11	EXR02450
	FOHDWT= MEMSTR + INSUL + IBOSS+ IGNITR + N13	EXR02460
C	CYLINDER WEIGHTS	EXR02470
	MEMSTC = PI *RHO* TC*D *LCYL	EXR02480
	LINER = N117*N4*PI*(D-2.*TC)*LCYL	EXR02490
	TCIM = N117	EXR02500
	TCIA = N117	EXR02510
	CYLWT = MEMSTC+LINER+N21	EXR02520
C	AFT HEAD WEIGHTS	EXR02530
	TAHIA = N115	EXR02540
	TAHIM = 2.*TAHIA-TCIM	EXR02550
	DN = SQRT(1.27323*EPSC*AT)	EXR02560
	IF (N23-1.) 190,187,190	EXR02570
187	MEMSTA = 4.*N22*TAH*PHO *(PI*D*D/2.-EPSC* AT)	EXR02580
	INSULA = N4*TAHIA*PI*((D-2.*TAH)**2/2.-DN**2/4.)	EXR02590
	GO TO 195	EXR02600
190	SAY1= SORT(1.-1./(N23**2))	EXR02610
	SAY = ALOG ((1.+ SAY1)/(1.-SAY1))	EXR02620
	MEMSTA = N22*TAH*RHO *(D**2 *(.7854 + .3925/(N23**2 * SAY1) * 1 SAY)-EPSC*AT)	EXR02630
	INSULA = N4*TAHIA*((D-2.*TAH)**2*(.7854+.3925*SAY/SAY1/N23**2) 1 -PI*DN**2/4.)	EXR02640
195	BOSS = 4.* N30 * TAH * RHO *D	EXR02650
511	AFTHDW = MEMSTA + BOSS + INSULA + N33	EXR02660
C	MISSILE WEIGHTS	EXR02670
C	CLD FORSKT = N34 + 2.*N35*TC*RHO *D +N36 *D**2 *(GMAX*ML/N37* (EXR02680
	FORSKT = N34 + N35*TC*RHO *D*PI +N36 *D**2 *(GMAX*ML/N37* (EXR02690
1	.215*(LCYL+D/N2)/D+1.)**.5 +DLFS*PI*D*TC*RHO	EXR02700
C	CLD AFTSKT = N38 + 2.*N39*TC*RHO*D**2+N40*D**2*((ML+MP/2.)/N37	EXR02710
	AFTSKT = N38 + PI*N39*TC*RHO*D +N40*D**2*((ML+MP/2.)/N37	EXR02720
1	* (.215*(LCYL +D/N23)/D + 1.))** .5	EXR02730
C	TOTAL INERT WEIGHT	EXR02740
	ME = FOHDWT + CYLWT + AFTHDW + FORSKT +AFTSKT + NOZWT + EXTWT	EXR02750
	MPMF=MP+ME	EXR02760
C	BURNOUT WEIGHT	EXR02770
	MR = ME + ML	EXR02780
C	LAUNCH WEIGHT	EXR02790
	MOC = MB + MP	EXR02800
	WPATL = DELVR/ISP/32.174	EXR02810
	WRAT= 2.71828**WRATL	EXR02820
	MP = (WRAT-1.)*(MB)	EXR02830
C	LAUNCH THRUST-TO-WEIGHT RATIO	EXR02840
	FIMOC = F/MOC	EXR02850
		EXR02860
		EXR02870
		EXR02880

	IF(J)2011,2011,255	EXR02890
255	F = F1MOC *MOC	EXR02900
	LOOP1 = LOOP1 + 1	EXR02910
	IF(ABS(F1MOC-F1MOC)-.01) 2011,2011,2003	EXR02920
2003	IF (KKK-4) 2015,2006,2006	EXR02930
2015	IF (LOOP1.GT.25)WRITE(6,BADRUN)	EXR02940
	IF (LOOP1-35) 1427,1427,258	EXR02950
2006	IF (IPRINP.NE.0) WRITE(6,2007) SDVI,MPFH,MPAH,ISP,MB	EXR02960
2007	FORMAT(46H NEGATIVE CYLINDER LENGTH,DELIVERED DELTA V = ,F10.3,	EXR02970
	1 17H PROP IN FWD HEAD,F10.5,17H PROP IN AFT HEAD,F10.5,/,	EXR02980
	2 5H ISP=, F10.5,17HBURN OUT WEIGHT =,F10.5)	EXR02990
	IND = 7	EXR03000
	GO TO 22	EXR03010
258	IF (IPRINP .GT. 0) WRITE(6,2012) F1MOC	EXR03020
	IND=5	EXR03030
	GO TO 22	EXR03040
2012	FORMAT(45H UNABLE TO FIND THRUST TO WEIGHT VALUE,F1MOC=,F10.5)	EXR03050
2011	SDVI= ISP*32.174*ALOG(MOC/MB)	EXR03060
	LOOP2=LOOP2+1	EXR03070
	IF (ABS(SDVI -DELVR)- .001*DELVR) 2004,2004,2116	EXR03080
2116	IF (KKK-4) 2005,2006,2006	EXR03090
2005	IF(((LOOP2+LOOP1).GT.90 .AND.(IPRINP.NE.0)) WRITE(6,BADRUN)	EXR03100
	IF (LOOP2+LOOP1-100)142,142,2008	EXR03110
2010	FORMAT(50H UNABLE TO CONVERGE AFTER 100 ITERATIONS,DELTA V =,	EXR03120
	1 F10.3)	EXR03130
2008	IF (IPRINP .GT. C)WRITE(6,2010) SDVI	EXR03140
	IND = 4	EXR03150
	GO TO 22	EXR03160
2004	CONTINUE	EXR03170
	SAY = RHOP * PI *(D/2. -TC -N117) * (LCYL +D*.5/N2 +D*.5/N23)*2.	EXR03180
	RB = F/ISP/SAY	EXR03190
C	MOTOR MASS FRACTION	EXR03200
	MMF = MP/(MP + ME)	EXR03210
	SAW = (D/2.-TFH) **2 *(D *.5/N2 -TFH)	EXR03220
	SAW1 = (D/2.- TAH)**2 * (D*.5/N23 -TAH)	EXR03230
C	VOLUMETRIC LOADING EFFICIENCY	EXR03240
	VOLLD = (MP/RHOP) /(PI *LCYL*(D/2.-TC)**2 +2.09*(SAW +SAW1))	EXR03250
	PHO=PHI*57.2957795	EXR03260
	ITOT= F*TB	EXR03270
	IMPWT = ITOT / MOC	EXR03280
	MPA = MP	EXR03290
	LT = LCYL + D*.5/N2+DLFS+XRN	EXR03300
712	TMOTOR = MP + ME	EXR03310
	IF(IEX .NE. 1) GO TO 713	EXR03320
	CFVA = CFV* FJ	EXR03330
	ISPV = CSTAP*CFVA/32.174	EXR03340
713	QSUB = PSUB*100.	EXR03350
	QPELL = 100.*PHELI	EXR03360
	FWHLT = D/N2*.5	EXR03370
	CASEWT = MEMSTR+MEMSTA+MEMSTC	EXR03380
	WTITOT = INSUL +INSULA+LINER	EXR03390
	WROSS = IROSS + ROSS	EXR03400
	WCON = N12 + N21+ N33	EXR03410
	FOACWT = FOPDWT + FORSKT	EXR03420
	TOMIS = FORSKT + AFTSKT	EXR03430

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AFTADW = AFTHDW + AFTSKT
FWT = FOADWT + MPFH
CWT = CYLWT + MPCYL
AWT = AFTADW + MPAH
THICK = .3
TG = TIEC*2.
CH = FOADWT + CYLWT + AFTADW
IF ( IPRINP .LE. C ) GO TO 275
CALL PAGE
WRITE(6,701)
WRITE(6,702) MP, F, CF, ME, F1MOC, TMOTOR, SDVI, CFVA,
1 ML, ITOT, TR, MOC, ISP, RR, MB, ISPV, AFAT
WRITE(6,703) D, PP, MMF, LCYL, PC, VOLLD, FWHLT, PAP, IMPWT, XRN, PF,
1 PETA, DLFS, LT
WRITE(6,704) IB
WRITE(6,705) MEMSTR, MEMSTC, MEMSTA, CASEWT, INSUL, LINER, INSULA, WTITOT
2, IBOS, BOSS, WBOSS, IGNITR,
3 IGNITR, FORSKT, AFTSKT, TOMIS, N13, N21, N33, WCCN,
4 FOADWT, CYLWT, AFTADW, CH, MPFH, MPCYL, MPAH, MP, NOZWT, FWT, CWT, AWT,
5 TMOTOR
WRITE(6,706) N114, TCIA, TAHIA, TCIM, TAHIM, TFH, TC, TAH
WRITE(6,714) FTU, FTY
714 FORMAT(6X, 23HULTIMATE CASE STRENGTH ,F8.0, 2X21HYIELD CASE STRENGTH
1 ,F8.0)
WRITE(6,707) TMIN
707 FORMAT(6X, 40HTHE MINIMUM ALLOWABLE CASE THICKNESS WAS, F9.5/)
750 WRITE (6,755)
WRITE(6,751) NBOSS, STHRSL, XCONF, INSRRG, THININ, XINSUL, NOZWT, XRN
755 FORMAT(//4X, 6HNOZZLE)
WRITE(6,752) QBELL, PHO, EPI, FPSC, AT
752 FORMAT(2X, 52H BELL HALF ANG EPI ENT RATIO THROAT AREA
1/2X, 8F10.5//)
751 FORMAT(2X, 77H NOZZLE THROAT EXIT INSERT THROAT
1IT CONE TOTAL TOTAL /6X, 74HBOSS STRUCTURE RETAINED
2R ASSEMBLY INSULATN WEIGHT LENGTH/2X, 8F10.5/)
701 FORMAT( 4X, 22HBOOSTER SIZING DETAILS ,
1 5X, 7HWEIGHTS, 20X
2, 11HPERFORMANCE, 12X, 1INTERNAL BALLISTICS')
702 FORMAT(6X, 12HPROPELLANT ,F10.2, 5X, THRUST ,F10.2, 5X, CF, ,9X, F9.3
1/
16X, 12HINERTS ,F10.2, 5X, THRUST/WT, F10.2/
26X, 12HTOTAL MOTOR ,F10.2, 5X, DELTA VI ,F10.3, 5X, CF VACUUM ,F9.3/
36X, 12HPAYLOAD ,F10.2, 5X, I TOTAL ,F10.2, 5X, BURN TIME ,F9.3/
46X, 12HLAUNCH WT ,F10.2, 5X, ISP DEL ,F10.3, 5X, BURN RATE ,F9.3/
56X, 12HBURN OUT WT ,F10.2, 5X, ISP VAC ,F10.3, 5X, PORT/THROAT, F9.3/
703 FORMAT( 5X, 1CHDIMENSIONS, 17X, 9HPRESSURES ,15X, 13HMISCELLANEOUS /
16X, 12HDIAMETER ,F10.3, 5X, DESIGN ,F10.2, 5X, MMF ,F9.4/
26X, 12HLT CYL ,F10.3, 5X, CHAMBER ,F10.2, 5X, VOL LOADING, F9.4/
36X, 12HLT FWD HEAD ,F10.3, 5X, AMBIENT ,F10.2, 5X, (I TCT)/WT ,F9.2/
46X, 12HLT NOZZLE ,F10.3, 5X, EXIT ,F10.2, 5X, 12HACZ CANT ANG ,
1 F8.2 /6X, 10HSKIRT EXTN ,
5 F12.3/6X, 8PTOTAL LT, F14.3)
704 FORMAT(14X, 28HBREAKDOWN OF CHAMBER DESIGN ,15X, 9HMATERIAL, 3A4/
127X, 42HFORWARD CYLINDER AFT TOTAL /5X, 7HWEIGHTS)
705 FORMAT(6X14H STRUCTURE ,4F12.3/

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16X,14H INSULATION	,4F12.3/6X,14H BOSS	,F12.3,12X,2F12.3/EXR03990
26X,14H IGNITER	,F12.3,24X,F12.3 /	EXR04000
36X,14H SKIRTS	, F12.3,12X,2F12.3/	EXR04010
46X,14H CONSTANTS	,4F12.3/6X,14HTOTAL CHAMBER ,4F12.3 /	EXR04020
56X,14H PROPELLANT	,4F12.3/6X,14HNOZZLE WEIGHT ,36X,F12.3/	EXR04030
65X,15HTOTAL WEIGHT	,4F12.3)	EXR04040
706 FORMAT(5X,1CHTHICKNESS /6X,10HINSULATION /		EXR04050
16X,4H AVG,10X,3F12.5 /6X,4H MAX,22X,2F12.5/6X,4HCASE,10X,3F12.5)		EXR04060
275 SGWT =(WRN+IGNITR/2. +MP)*FACTOR		EXR04070
WMC=CASEWT+WBOSS+TOMIS		EXR04080
WM=TMOTOR		EXR04090
NCZWTX=NOZWT		EXR04100
MPX=MP		EXR04110
CASEMX=CASEM		EXR04120
VRI=WTITOT/N4		EXR04130
CTHRT=2. * SQRT(AT/PI)		EXR04140
RNOZI=RT/COS(BETA)		EXR04150
MP= MP*FACTOR		EXR04160
MPMF= MPMF*FACTOR		EXR04170
BEXIT = EPI * AT / 144.		EXR04180
PTHVAC = F * ISPV / ISP		EXR04190
PTHVAC = BTHVAC * FACTOR		EXR04200
BEXIT = BEXIT * FACTOR		EXR04210
BISPV = ISPV		EXR04220
BCOWP = MP		EXR04230
DROPEB = MOC * FACTOR		EXR04240
DROPEB = ME * FACTOR		EXR04250
RETURN		EXR04260
22 IF (IPRINP .LE. 0) RETURN		EXR04270
WRITE (6,12) IND		EXR04280
WRITE(6,652) APE2,ML,A6Z3,A5Z3,PA		EXR04290
WRITE(6,PADRUN)		EXR04300
RETURN		EXR04310
135 IF (IPRINP .LE. C) RETURN		EXR04320
WRITE (6,36) MCASE		EXR04330
36 FORMAT(26H ERROR IN SUBROUTINE MATLS ,15)		EXR04340
RETURN		EXR04350
9023 IF (IPRINP .LE. C) RETURN		EXR04360
WRITE (6,9024) GAM, EPI, PHI		EXR04370
9024 FORMAT(16H ERROR IN NOZEX ,3F20.6)		EXR04380
RETURN		EXR04390
END		EXR04400

SUBROUTINE PROPX(FLY)	PPXX0010
COMMON /TOVPER/ BOOWP,BISPV,BTHVAC,BEXIT,SUSWP,SEXIT,BCANTA,	PPXX0020
1 WTINIT,DROPEB,KIZ,ZA5,ZA6,ZAC,ZD3,EXTRA(57)	PPXX0030
COMMON /FAILURE/ KFAIL	PPXX0040
COMMON /PRINTR/ IPRINP,KTIMES,I5(5)	PPXX0050
COMMON /CMOPT/ I4(4),KBMOI,I2(2)	PPXX0060
COMMON/ SURVD/ IND(10),IBUST,BASEWT	PPXX0070
COMMON /ADDON/ SPPWF,CONS,FF(18)	PPXX0080
COMMON /LOOPXX/ LOOPRJ,CFNSAV,WTSAB,WSSAV,SLSAV	PPXX0090
COMMON /EXTRJ/ISKIP	PPXX0100

	COMMON/SEPOWR/ SP(48)	PPXX0110
	EQUIVALENCE	PPXX0120
	1(SP(1),WTSP),(SP(2),VOLSP)	PPXX0130
	COMMON/CODEXX/ II(16)	PPXX0140
	COMMON/RJBLOK/ RJ(50)	PPXX0150
	COMMON/ALFPLK/ AMACH1,A, ALT1,GAMRAD, ACCN, ACCT, CDO, C, SREF,	PPXX0160
	1 ACWT, ALFA,CFNREQ, DEG, CLALFD	PPXX0170
	DIMENSION SCDIL(3), SADIL(3)	PPXX0180
	DIMENSION SAV4(14), AMSAV(14)	PPXX0190
	EQUIVALENCE (SCDIL(1), CDINL)	PPXX0200
	EQUIVALENCE (AMSAV(1), AMACH1)	PPXX0210
	COMMON /INDATX/ HPP(22), HP	PPXX0220
	COMMON /INDATA/ CDINL, CLALF,WTINLT	PPXX0230
C	CODEXX EXTERNAL INTEGER ARRAY	PPXX0240
	EQUIVALENCE	PPXX0250
	1(II(1),KIND),(II(2),INLET),(II(3),ISIZE),(II(4),NOPP),	PPXX0260
	1(II(5),KSUS),(II(6),KFM),(II(7),IBSTIN),	PPXX0270
	2(II(13),IEX),(II(14),NPASS),(II(15),NOUT),(II(16),IXXA)	PPXX0280
	COMMON /PJCAT/ CFNRQ,CFNET,A5A3,A6A3,ACA3,SFC,BOSTWT,BOSTLT,	PPXX0290
	1 POSTPR	PPXX0300
	DIMENSION RJSA(9)	PPXX0310
	EQUIVALENCE (RJSA(1), CFNRQ)	PPXX0320
	COMMON /TRAJX/ TRSA(10)	PPXX0330
	DIMENSION SAV1(50), SAV2(10), SAV3(9)	PPXX0340
	COMMON /EXTERN/ AP (20)	PPXX0350
	EQUIVALENCE	PPXX0360
	1(AR(1),PLLT),(AR(2),PLEX),(AR(3),D3),(AR(4),RANGE),	PPXX0370
	2(AR(5),WTTOT),(AR(6),XLTOT),(AR(7),VL),(AR(8),VEQR),	PPXX0380
	3(AR(9),DELVI),(AR(10),PLMASS),(AR(11),ARSURF),(AR(13),PAYLD)	PPXX0390
	EQUIVALENCE(AR(15),COMLT),(AR(20),CFSTOR)	PPXX0400
	COMMON /TRJDTA/ POINT(10,7)	PPXX0410
	COMMON /GOROL/ WARD(78)	PPXX0420
C	ICALF = 1 CALCULATE ANGLE OF ATTACK	PPXX0430
C	ICALF = 0 USE INPUT ANGLE OF ATTACK	PPXX0440
C	NEWPT = 1 POINT IS NEW, INITIALIZE	PPXX0450
C	NEWPT = 0 POINT IS NOT NEW, BYPASS INTIALIZATION	PPXX0460
	COMMON /IPROP/ IND,IMIN,NEWPT,IRJOUT	PPXX0470
	COMMON /SUSDAT/ TX(44)	PPXX0480
	EQUIVALENCE	PPXX0490
	1 (TX(22),XFMB),(TX(24),WFMB),	PPXX0500
	9(TX(33), SUSLT),(TX(34),SUSWT),(TX(35),FTUS),(TX(36),FTYS),	PPXX0510
	1(TX(37), SMLT),(TX(38),SMWT),(TX(39),FMINT),(TX(40),FUSARL)	PPXX0520
	COMMON /EXXRJ/ EX(48)	PPXX0530
	EQUIVALENCE (EX(27),WRJ),(EX(28),XRJ)	PPXX0540
	DATA XSPP,XDR,XSDP,ZRJ,XSRJ,XRAM,XBOOST/4HSPPG,4HDRCC,4HDPPG,	PPXX0550
	1 4HRJET,4HRJSS,4HXRJ,4HBSTR /	PPXX0560
C	II(11) = 0 NO MCI OR CG HACK	PPXX0570
C	II(11) = 1 HACK MCI AND CG DATA	PPXX0580
	IFLY = 1	PPXX0590
	KFAIL = 0	PPXX0600
	KTIMES = 0	PPXX0610
	II(11) = 0	PPXX0620
C	DO NOT CHANGE TT4	PPXX0630
C	II(10) = 0	PPXX0640
	NCUT = IPRINP	PPXX0650

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IF ( IPRINP .LT. -1 ) NOUT = 0
NCFN = 0
INC = 0
CAVT = W3D(17)
IPUST = 0
IF(KIND.LT.40) GO TO 10
IF(NPASS .GT. 0) GO TO 129
NEWPT = 1

C
IPSTIN = 0
IF(KIND .GE. 50) GO TO 60
DO 444 I=1,NODP
444 IND(I) = 0
IMIN= 1
ISKIP = 0
IF( ISIZE .GT.1) GO TO 110
100 SUSLT=(XLTOT -PLLT)/2.
WTTOT = PLMASS*3.0
IF(LOOPRJ.GT.0) SUSLT = SLSAV
IF(LOOPRJ.GT.0) WTTOT=WTSVAV
AR(19) = SUSLT
SLTOLD = SUSLT
GO TO 130
129 IF(KIND .GE. 50) GO TO 60
IF ( KIND .EQ. 42 ) RETURN
GO TO 130
132 CALL SCUCER
IF ( KFAIL .GT. 0 ) RETURN
GO TO 133
110 SUSWT=(WTTOT -PLMASS)/3.
IF(LOOPRJ.GT.0) SUSWT = WSSAV
AR(19) = PLLT
SWTOLD = SUSWT
130 WTSP = WTTOT*SPPWF
PLEX = PLMASS + WTSP + ARSURF
IF(KIND .EQ. 42) GO TO 132
IF(KIND.EQ.44) SUSLT=(XLTOT-PLLT) * .7
IF(KIND.EQ.44) SUSWT=(WTTOT-PLEX) * .7
C
SUPPRESS OUTPUT IN SUSMAS
NOUTN = NOUT
NOUT = 0
CALL SUSMAS
NOUT = NOUTN
IF ( KFAIL .GT. 0 ) RETURN
133 IF ( IND .NE. 0) GO TO 25
NPASS = NPASS + 1
131 CALL PROPRJ
IF(KIND.NE.44) GO TO 137
POSTLT=0.
POSTWT=0.
137 CONTINUE
CCMLT=POSTLT
NCFN = NCFN + 1
CFNNEW = CFNRQ
IF (NOUT.NE.0) WRITE(6,993) WTSP

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PPXX0660
PPXX0670
PPXX0680
PPXX0690
PPXX0700
PPXX0710
PPXX0720
PPXX0730
PPXX0740
PPXX0750
PPXX0760
PPXX0770
PPXX0780
PPXX0790
PPXX0800
PPXX0810
PPXX0820
PPXX0830
PPXX0840
PPXX0850
PPXX0860
PPXX0870
PPXX0880
PPXX0890
PPXX0900
PPXX0910
PPXX0920
PPXX0930
PPXX0940
PPXX0950
PPXX0960
PPXX0970
PPXX0980
PPXX0990
PPXX1000
PPXX1010
PPXX1020
PPXX1030
PPXX1040
PPXX1050
PPXX1060
PPXX1070
PPXX1080
PPXX1090
PPXX1100
PPXX1110
PPXX1120
PPXX1130
PPXX1140
PPXX1150
PPXX1160
PPXX1170
PPXX1180
PPXX1190
PPXX1200

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953	FORMAT(10X20HSECONDARY POWER PKG , F10.1)	PPXX1210
	IF (KFAIL .GT. 0) RETURN	PPXX1220
	IF(IND.NE.0) GO TO 25	PPXX1230
	IF(NPASS .GT. 50) GO TO 35	PPXX1240
	IF(IFX .NE. 1) WRJ = 0.	PPXX1250
	IF(ISIZE.EQ.1) WTTOT = PLMASS + ARSURF+ SUSWT+ BOSTWT + WRJ	PPXX1260
	1 + WTINLT	PPXX1270
	IF(ISIZE.EQ.1) WTSP=WTTOT * SPPWF	PPXX1280
	IF (ISIZE.EQ.1) WTTOT = WTTOT + WTSP	PPXX1290
	PLFX = PLMASS + WTSP + ARSURF	PPXX1300
	IF(IFX.EQ.1) GO TO 2000	PPXX1310
	BASEWT = WTTOT -CONS	PPXX1320
	GO TO 2001	PPXX1330
2000	BASEWT = WTTOT -BOSTWT	PPXX1340
2001	AMACH1 = POINT(1,2)	PPXX1350
	Q= 0.7 *AMACH1*AMACH1*RJ(34)	PPXX1360
	ACWT = BASEWT - FUSABL*POINT(1,6)	PPXX1370
	SPEF = AR(12)	PPXX1380
	A= 49.02* SQRT(RJ(33))	PPXX1390
	ACCN = POINT(1,3)	PPXX1400
	ACCT = POINT(1,4)	PPXX1410
	ALT1 = POINT(1,1)	PPXX1420
	GAMRAD =POINT(1,5) /57.29578	PPXX1430
	AR(16) = AMACH1	PPXX1440
	HP = ALT1	PPXX1450
	NDESPT = 1	PPXX1460
	CALL XALPHA (NDESPT)	PPXX1470
	IF (KFAIL .GT. 0) RETURN	PPXX1480
	CFNRQ = CFNRQ	PPXX1490
	RJ(25)= ALFA*57.2958	PPXX1500
	IF (NOUT .GT. 0) WRITE(6,91) CFNRQ,RJ(25)	PPXX1510
91	FORMAT(11H XALPHA DATA,10X, 9HCFNRQ = ,F10.5,3X, 8HALPHA = ,F10.5)	PPXX1520
	IF(IBUST.EQ.1) RETURN	PPXX1530
	IF(NEWPT.EQ. 1) GO TO 133	PPXX1540
	EPX=.003	PPXX1550
	DCF=CFNRQ - CFNET	PPXX1560
	IF(NOUT.NE.0) WRITE(6,1257) DCF, CFNRQ, CFNET	PPXX1570
1257	FORMAT(/ 5X21HCEN ITERATION MISS IS , F10.4 ,	PPXX1580
	1 10X15HREQUIRED CFN IS , 6X, F10.4 / 41X,	PPXX1590
	2 5X16HAVAILABLE CFN IS,5X,F10.4)	PPXX1600
	IF(ABS(CFNET/CFNRQ - 1.) .LE. EPX) GO TO 1133	PPXX1610
	DCFNEW = DCF	PPXX1620
	IF(NCFN.GT.1) CFNRQ=CFNOLD-DCFOLD*(CFNNEW-CFNOLD) /	PPXX1630
	1 (DCFNEW-DCFOLD)	PPXX1640
1132	FORMAT(/5X14HPREDICTION NO. , 110 / 19X,5F10.4 /)	PPXX1650
	IF (NOUT .NE. 0) CALL PAGE	PPXX1660
	CFNOLD = CFNNEW	PPXX1670
	DCFOLD = DCFNEW	PPXX1680
	GO TO 133	PPXX1690
1123	CONTINUE	PPXX1700
	IF (NOUT .NE. 0) CALL PAGE	PPXX1710
	CALL RJWT	PPXX1720
	NOUTSV = NOUT	PPXX1730
	IF (IPRINP .LT. 0) NOUT = 1	PPXX1740
	DO 331 IZ=1,9	PPXX1750

331	SAV3(IZ)=RJSA(IZ)	PPXX1760
	DO 332 IZ=1,10	PPXX1770
332	SAV2(IZ)=TRSA(IZ)	PPXX1780
	DO 333 IZ=1,50	PPXX1790
333	SAV1(IZ)=RJ(IZ)	PPXX1800
	DO 383 IZ=1,14	PPXX1810
383	SAV4(IZ) = AMSAV(IZ)	PPXX1820
	DO 796 IZ=1,3	PPXX1830
796	SADIL(IZ) = SCDIL(IZ)	PPXX1840
	CALL SURVEY	PPXX1850
	DO 797 IZ=1,3	PPXX1860
797	SCDIL(IZ) = SADIL(IZ)	PPXX1870
	DO 387 IZ = 1, 14	PPXX1880
387	AMSAV(IZ) = SAV4(IZ)	PPXX1890
	DO 351 IZ=1,9	PPXX1900
351	RJSA(IZ)=SAV3(IZ)	PPXX1910
	DO 352 IZ=1,10	PPXX1920
352	TRSA(IZ)=SAV2(IZ)	PPXX1930
	DO 353 IZ=1,50	PPXX1940
353	RJ(IZ)=SAV1(IZ)	PPXX1950
	AMACH1 = POINT(1,2)	PPXX1960
	Q = 0.7 * AMACH1 * AMACH1 * RJ(34)	PPXX1970
	ACWT = BASEWT - FUSABL * POINT(1,6)	PPXX1980
	SREF = AR(12)	PPXX1990
	A = 49.02 * SQRT (RJ(33))	PPXX2000
	ACCN = POINT(1,3)	PPXX2010
	ACCT = POINT(1,4)	PPXX2020
	ALT1=POINT(1,1)	PPXX2030
	GAMRAD=POINT(1,5) / 57.29578	PPXX2040
	AP(16) = AMACH1	PPXX2050
	FP = ALT1	PPXX2060
	SUSWP = FUSAPL	PPXX2070
	BCANTA = CANT	PPXX2080
	ZA5 = A5A3	PPXX2090
	ZA6 = A6A3	PPXX2100
	ZAC = ACA3	PPXX2110
	ZC3 = D3	PPXX2120
	KIZ = KIND	PPXX2130
	IF (KFAIL .GT. C) RETURN	PPXX2140
	IF(IND .NE. 0 .OR.(IRUST .NE. 0 .AND. KSUS .EQ. 1)) RETURN	PPXX2150
	IF (NEWPT .EQ. 1) GO TO 131	PPXX2160
	KTIMES = 1	PPXX2170
C	OUTPUT FINAL DATA	PPXX2180
215	FORMAT(1H1)	PPXX2190
	IF (NOUT .GT. 0) WRITE (6,7006)	PPXX2200
7006	FORMAT(21H SUMMARY OUTPUT DATA)	PPXX2210
	ITYPE =KIND -40	PPXX2220
	IF (ITYPE .GT. 4) GO TO 2204	PPXX2230
	GO TO (200,201,202,203),ITYPE	PPXX2240
2204	IF(NOUT.GT.0) WRITE(6,2205)	PPXX2250
2205	FORMAT(1X,2CHTANDEM ROCKET RAMJET //)	PPXX2260
	GO TO 216	PPXX2270
220	IF (NOUT .GT. 0) WRITE (6,204)	PPXX2280
204	FORMAT(24H INTEGRAL ROCKET RAMJET //)	PPXX2290
	GO TO 216	PPXX2300

201	WRITE(6,205)	PPXX2310
205	FORMAT(14H DUCTED ROCKET //)	PPXX2320
216	IF(1SIZE.EQ.2) XLTOT = PLLT + SUSLT + BOSTLT	PPXX2330
	IF (NOUT .LE. 0) GO TO 8493	PPXX2340
	GO TO 210	PPXX2350
202	WRITE(6,206)	PPXX2360
206	FORMAT(24H EXTERNAL BOOSTED RAMJET //)	PPXX2370
	GO TO 217	PPXX2380
203	IF (NOUT .GT. 0) WRITE (6,207)	PPXX2390
207	FORMAT(17H UNBOOSTED RAMJET //)	PPXX2400
217	IF(1SIZE.EQ.2) XLTOT = PLLT + SUSLT + XRJ	PPXX2410
210	CONTINUE	PPXX2420
	IF (NOUT .LE. 0) GO TO 8493	PPXX2430
	KICK=1	PPXX2440
	IF (KICK .GT. 0) GO TO 8493	PPXX2450
225	FORMAT(5X,13HINLET WEIGHT ,F9.2,13X,13HINLET DRAG ,F10.5)	PPXX2460
211	FORMAT(22X,6HWEIGHT,4X,6HLENGTH /	PPXX2470
	15X,13HPAYLOAD ,F9.1,2X,F9.3 /	PPXX2480
	25X,13HAERO SURFACES,F9.4,/	PPXX2490
	35X,13H2ND P PACKAGE ,F9.4,/	PPXX2500
	45X,13HFUEL MGMT BAY,F9.4,2X,F9.4 /	PPXX2510
	55X,13HSUSTAINER ,F9.1,2X,F9.3)	PPXX2520
212	FORMAT(5X,13HCOMBUSTOR ,F9.1,2X,F9.3)	PPXX2530
213	FORMAT(5X,13HROOSTER ,F9.1,2X,F9.3,2X13HPROPELLANT WT,F10.2)	PPXX2540
214	FORMAT(5X,13HTOTAL ,F9.1,2X,F9.3)	PPXX2550
8493	CONTINUE	PPXX2560
	B7=COMLT	PPXX2570
	IF(KIND.EQ.44) COMLT=XRJ	PPXX2580
	CALL INLETP	PPXX2590
	COMLT=BZ	PPXX2600
	CALL CDINLT	PPXX2610
	II(11) = 1	PPXX2620
	IF(KIND.EQ.42) GO TO 7001	PPXX2630
	AAA=XSPJ	PPXX2640
	IF (NOUT .NE. 0) CALL PAGE	PPXX2650
	CALL SUSMAS	PPXX2660
	IF (NOUT .NE. 0) WRITE(6,993) WTSP	PPXX2670
	IF (KFAIL .GT. 0) RETURN	PPXX2680
	CALL RJCES	PPXX2690
	IF(IND.NE.0) GO TO 7000	PPXX2700
	SFC = PJ(7)*RJ(15)*ACA3/CFNET	PPXX2710
7002	AAA=7RJ	PPXX2720
	CALL RJWT	PPXX2730
	IF(IND.NE.0) GO TO 7000	PPXX2740
	IF(IEF.EQ.1) GO TO 7003	PPXX2750
7004	AAA=XROOST	PPXX2760
	IF (KIND .NE. 44) CALL PAGE	PPXX2770
	IF(KIND.NE.44) CALL ROOST(DELVI,PAYLD,A6A3,A5A3,0,ROSTPR,ROSTWT,	PPXX2780
	1 BOSTLT,IND,CONS)	PPXX2790
	IF(IND.NE.0) GO TO 7000	PPXX2800
	IFLY = 0	PPXX2810
	CFNSAV = CFNRQ	PPXX2820
	WTSAB = WTTOT	PPXX2830
	SLSAV = SUSLT	PPXX2840
	WSSAV = WTTOT - ROSTWT - PLMASS - ARSURE - WTSP	PPXX2850

	IF (NOUT .EQ. 0) RETURN	PPXX2860
C	PRINT MISSILE SCHEMATIC	PPXX2870
	CALL PAGE	PPXX2880
	WRITE(6,8221)	PPXX2890
8221	FORMAT(/// 5X,25HMISSILE SYNTHESIS SUMMARY //)	PPXX2900
	WRITE(6,8100) WTTOT, XLTOT	PPXX2910
8100	FORMAT(15X9HTOTAL WT=,F7.1 / 15X9HTOTAL LT=,F7.1)	PPXX2920
	WRITE(6,8110) (POINT(1,IC), IC=1,7)	PPXX2930
8110	FORMAT(/15X,14HDESIGN POINT =,F8.0, 1H/,F4.2,1H/,F4.2,1H/,	PPXX2940
	1 F4.2,1H/,F6.2,1H/,F4.2,1H/,F5.0 //)	PPXX2950
	NDESPT = 1	PPXX2960
	CALL XALPHA (NDESPT)	PPXX2970
	WRITE(6,8666)	PPXX2980
8666	FORMAT(////)	PPXX2990
	WRITE(6,8111) ARSURE	PPXX3000
8111	FORMAT(71X13H WT(W+T)=, F6.1,4H //	PPXX3010
	1 50X , 8H..... / 61X15H.....,13X1H.,7X1H. /	PPXX3020
	2 60X1H.,14X1H., 12X1H.,8X1H.)	PPXX3030
	WRITE(6,8112)	PPXX3040
8112	FORMAT(39X,1CH....., 49H.....	PPXX3050
	1.....)	PPXX3060
	WRITE(6,8113) D3	PPXX3070
8113	FORMAT(35X1H., 13X1H.,18X1H.,27X2H.. / 34X1H ,14X1H., 18X1H.,	PPXX3080
	1 26X3H. ., 5X5HD3 =, F7.1)	PPXX3090
	SUSWX = WTTOT - BOSTWT - PLMASS - ARSURE	PPXX3100
	SREX = SREF * 144.	PPXX3110
	WRITE(6,8114) PLLT,SUSLT,BOSTLT,SREX,PLMASS,SUSWX,BOSTWT,ACA3	PPXX3120
8114	FORMAT(33X1H.,2X4HPL=,F6.1,3X1H.2X,6HLSUST=,F7.1,3X5H.....,	PPXX3130
	1 4X5H800=,F7.1, 4X2H..2X1H., 5X5HA3 =,F7.1 /	PPXX3140
	2 33X1H ,2X4HWP1=,F6.1,3X1H.2X,6HWSUST=,F7.1,3X5H. .,	PPXX3150
	3 4X5H800=,F7.1, 4X2H..2X1H., 5X5HACA3=,F7.4)	PPXX3160
	WRITE(6,8115) FUSARL,BOSTPR,A5A3,A6A3	PPXX3170
8115	FORMAT(22X1H.,15X1H.,2X6HWFUEL=,F7.1, 3X5H....., 4X5HWPBPR=,F7.1,	PPXX3180
	1 4X2H..,2X1H., 5X5HA5A3=,F7.4 / 34X1H ,14X1H.,18X1H.,	PPXX3190
	2 26X3H. ., 5X5HA6A3=,F7.4 / 36X1H.,12X1H.,18X1H., 27X2H..)	PPXX3200
	WRITE(6,8112)	PPXX3210
	WRITE(6,8311)	PPXX3220
8311	FORMAT(60X1H., 14X1H., 12X1H., 8X1H. / 61X15H..... ,	PPXX3230
	1 13X1H., 7X1H. / 90X8H.....)	PPXX3240
	ACX= ACA3 * SREF * 144.	PPXX3250
	WRITE(6,8116) ACX,WTINLT	PPXX3260
8116	FORMAT(/// 66X7HC.AREA= , F7.1 / 66X7HWT.INL= , F7.1 ///)	PPXX3270
	RETURN	PPXX3280
7001	AAA=XSDR	PPXX3290
	CALL SDUCER	PPXX3300
	IF (KFAIL .GT. C) RETURN	PPXX3310
	CALL CPROS	PPXX3320
	IF(IND.NE.0) GO TO 7000	PPXX3330
	SFC = RJ(7)*RJ(15)*ACA3/CFNET	PPXX3340
	GO TO 7002	PPXX3350
7003	AAA=XRAM	PPXX3360
	IF(NOUT.NE.C) CALL PAGE	PPXX3370
	CALL EXRAM	PPXX3380
	IF (KFAIL .GT. C) RETURN	PPXX3390
	IF(IND.NE.0) GO TO 7000	PPXX3400

GO TO 7004	PPXX3410
7000 IF(NOUT.NE.0) WRITE(6,7005) AAA	PPXX3420
7005 FORMAT(21H ERROR IN SUBROUTINE ,A4,27H WHEN TRYING TO OUTPUT DATA)	PPXX3430
RETURN	PPXX3440
10 IF (NOUT .LE. 0) RETURN	PPXX3450
IF (KIND/10 - 2) 20,30,40	PPXX3460
20 WRITE(6,21)	PPXX3470
21 FORMAT(51H NO SOLID ROCKET CAPABILITY IN ROUTINE AT THIS TIME)	PPXX3480
RETURN	PPXX3490
30 WRITE(6,31)	PPXX3500
31 FORMAT(51H NO LIQUID ROCKET CAPABILITY IN ROUTINE AT THIS TIME)	PPXX3510
RETURN	PPXX3520
40 WRITE(6,41)	PPXX3530
41 FORMAT(51H NO COMBINED CYL CAPABILITY IN ROUTINE AT THIS TIME)	PPXX3540
RETURN	PPXX3550
60 IF (NOUT .GT. 0) WRITE (6,61)	PPXX3560
61 FORMAT(32H TURBOJET LOGIC NOT YET INCLUDED)	PPXX3570
RETURN	PPXX3580
25 IF(NOUT.NE.0) WRITE(6,26)	PPXX3590
26 FORMAT(16H ERROR IN PROPRJ)	PPXX3600
RETURN	PPXX3610
25 IF(NOUT.NE.0) WRITE(6,36)	PPXX3620
36 FORMAT(38H EXCESSIVE ITERATIONS IN EXTERNAL LOOP)	PPXX3630
RETURN	PPXX3640
END	PPXX3650

SUBROUTINE BOOST (APE2,PL,A6Z3,A5Z3,IPRINT,MP,MPMF,LT,IND,SGWT)	BOOST0010
REAL NOZWTX,MPX	BOOST0020
COMMON /COMVLS/ COM(51)	BOOST0030
EQUIVALENCE (COM(16),WMC),	BOOST0040
1 (COM(17),VBI),	BOOST0050
2 (COM(15),DCOM),	BOOST0060
3 (COM(20),NOZWTX),	BOOST0070
4 (COM(21),MPX),	BOOST0080
5 (COM(22),CASEMX),	BOOST0090
6 (COM(9),R5X),	BOOST0100
7 (COM(10),Y1X)	BOOST0110
COMMON /TOVPER/ BOOWP,BISPV,BTHVAC,BEXIT,SUSWP,SEXIT,BCANTA,	BOOST0120
1 WTINIT,DROPS,ROPER,KIZ,ZA4(4),EXTRA(57)	BOOST0130
COMMON /MATYP/ IR(3)	BOOST0140
COMMON/CODEXX/ II(16)	BOOST0150
EQUIVALENCE	BOOST0160
2(II(13),IEX),(II(15),NOUT)	BOOST0170
COMMON/ARRAY/ F,PC,PAP,CF,CFB,ISP,TB	BOOST0180
COMMON /BESYET/ FACTOR, BES14(14)	BOOST0190
COMMON /CORCL/ WARD (78)	BOOST0200
COMMON /CODERT/ IFIRST,JRJ,J	BOOST0210
COMMON /INSERT/ WG,WA,WTR,WC,WTI,DELA,PE,X1,XG,XI,WRN,EPSC,	BOOST0220
1 A6A3,A5A3,Y1,RC, AT,XRN,TIEC,RE,RECHK,PI,CFVA, TTH,	BOOST0230
1 THFD,ICG,X3,Z1,XA,LN,TAH,NOZWT,ISPV	BOOST0240
REAL ISP,N1,N2,N3,N4, N9,N10,N11,N13, N21,N22,N23	BOOST0250
1 ,N24, N30,N33,N34,N35,N36,N37,N38,N39,N40,	BOOST0260
2 N77,N78,N79,N80,N81,N82,N83,N84,N85,N114,N115,N117,	BOOST0270

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3      N119,N120,N121,LN,LT,   LCYL,MPEH,MPAH,MPCYL,MP,MPA,MEMSTR,BOST0280
4      INSUL,LINER,IBOSS,NBOSS,ML,IGNITR,MEMSTC,MEMSTA,INSULA,      BOST0290
5      INSRRG,NOZWT, ME, MB, MCC, MMF,MPMF,ITOT, IMPWT,ISPV      BOST0300
COMMON /NOZMP/ DZ1(28),ZNOZ,XINOZ      BOST0310
DIMENSION WT(20),Z(20),ZW(20),XII(20)      BOST0320
EQUIVALENCE      BOST0330
1(WT(1),IBOSS), (WT(2),MEMSTR), (WT(3),MPEH), (WT(4),IGNITR), BOST0340
2(WT(5),INSUL), (WT(7),MEMSTC), (WT(8),LINER), (WT(10),MPCYL), BOST0350
3(WT(11),MEMSTA), (WT(12),INSULA), (WT(13),MPAH), (WT(14),RCSS), BOST0360
4(WT(16),FORSKT), (WT(17),AFTSKT), (WT(19),ZNFENG) BOST0370
EQUIVALENCE      BOST0380
1(WARD(1),D), (WARD(3),FJ), (WARD(4),PA),      BOST0390
2(WARD(5),F1), (WARD(6),PBELL), (WARD(7),PHI),      BOST0400
3(WARD(8),GAM), (WARD(9),RHOP), (WARD(11),CSTAR),      BOST0410
4(WARD(12),PCM), (WARD(13),FSYLD), (WARD(14),FSULT),      BOST0420
5(WARD(15),TMIN), (WARD(16),TCASEF), (WARD(17),BETA),      BOST0430
6(WARD(18),CASEM), (WARD(19),DM), (WARD(20),ETAX),      BOST0440
7(WARD(21),DLFS), (WARD(23),N1), (WARD(24),N2),      BOST0450
8(WARD(25),N3), (WARD(26),N4), (WARD(27),N114),      BOST0460
9(WARD(28),N5), (WARD(29),N10), (WARD(30),N11),      BOST0470
X(WARD(31),N13), (WARD(32),VRFH), (WARD(33),N34)      BOST0480
EQUIVALENCE      BOST0490
1(WARD(34),N35), (WARD(35),N36), (WARD(36),N37),      BOST0500
2(WARD(37),N38), (WARD(38),N39), (WARD(39),N40),      BOST0510
3(WARD(40),GMAX), (WARD(41),N22), (WARD(42),N23),      BOST0520
4(WARD(43),N24), (WARD(44),N33), (WARD(45),N115),      BOST0530
5(WARD(46),N117), (WARD(47),FMPAH), (WARD(48),N30),      BOST0540
6(WARD(49),N21), (WARD(50),N77), (WARD(51),N78),      BOST0550
7(WARD(52),N79), (WARD(53),N80), (WARD(54),N81),      BOST0560
8(WARD(55),N82), (WARD(56),N83), (WARD(57),N84),      BOST0570
9(WARD(58),N85), (WARD(59),N121), (WARD(61),EPI),      BOST0580
X(WARD(62),PSUB), (WARD(63),RHO)      BOST0590
NAMELIST /BADRUN/ A5A3,A6A3, MCC, ME,MPCYL,MPAH,MPEH,ISPV,      BOST0600
INCZWT,FIMOC,FIMO,DELVP,SDVI,LCYL,AT,LOOP1,LOOP2      BOST0610
12  FORMAT (//10X17HPROBLEM STOP NO. 12,15H HAS OCCURRED. )      BOST0620
AFAT = WARD(10)      BOST0630
TTH= WARD(22)*.01745329      BOST0640
IF(IFX.LT.1) FACTOR=1.      BOST0650
RR = D/2.      BOST0660
IF ( IFX .GT. C ) TIEC = 0.0      BOST0670
IPRINP = NOUT      BOST0680
ML=PL/FACTOR      BOST0690
EXTWT = 0.      BOST0700
TR = 5.      BOST0710
IF(IFIRST.LT.1) GO TO 66C      BOST0720
PSUB = 1.0      BOST0730
IFIRST = 0      BOST0740
BETA= BETA*.01745329      BOST0750
IF (IPRINP .LE. 0 ) GO TO 660      BOST0760
IF(IEX.GT.0)WRITE(6,301)      BOST0770
301  FORMAT(17H EXTERNAL BOOSTER)      BOST0780
WRITE(6,652) APE2,ML,A6Z3,A5Z3,PA      BOST0790
652  FORMAT(//35H VALUES OF BOOST CALL LIST / 3X,      BOST0800
1      61H DELTA V PAYLOAD A6A3 A5A3      BOST0810
1P AMR      BOST0820

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2	/ 3X, 2F10.3,3F10.5,F10.2/)	R0ST0830
	IF(J) 653,654,655	R0ST0840
653	WRITE (6,655)	R0ST0850
655	FORMAT(10X22H THRUST TO WEIGHT INPUT /)	R0ST0860
	GO TO 660	R0ST0870
654	WRITE (6,657)	R0ST0880
657	FORMAT(10X13H THRUST INPUT /)	R0ST0890
660	INC=0	R0ST0900
	PC = WARD(2)	R0ST0910
	DELVR = APE2	R0ST0920
	PAP = PA	R0ST0930
	IF(PAP .LE. 0) PAP = .COC1	R0ST0940
6001	PI=3.141593	R0ST0950
	A5A3 = A573	R0ST0960
	A6A3 = A673	R0ST0970
	ISP = CSTAR*1.5/32.174	R0ST0980
	WRATL =DELVR/ISP /32.174	R0ST0990
	WPAT= 2.71828**WRATL	R0ST1000
	MP=(WRAT*ML-ML)/(1.2-.2*WRAT)	R0ST1010
	IF (J) 2200,2202,2200	R0ST1020
2202	F = F1	R0ST1030
	GO TO 2201	R0ST1040
2200	F = (1.2 * MP*ML)*F1	R0ST1050
2201	TP = MP*ISP/F	R0ST1060
	IF(A6A3 .LE. A5A3) A6A3 = A5A3 + .001	R0ST1070
	IF (GAM -1.0) 30, 30, 35	R0ST1080
30	INC = 2	R0ST1090
	IF (IPRINP .GT. 0) WRITE (6,9002) GAM	R0ST1100
9002	FORMAT(42H GAMMA LESS THAN 1 NOT PERMITTED. GAMMA = ,F16.6)	R0ST1110
	GO TO 22	R0ST1120
C	TEST TO DETERMINE IF F IS INPUT OR TO BE FOUND BY ITERATION	R0ST1130
35	IF (J) 100,95,100	R0ST1140
95	F = F1	R0ST1150
	GO TO 103	R0ST1160
100	F1MC = F1	R0ST1170
103	LOOP2 = 1	R0ST1180
	KKK=0	R0ST1190
	ICG = 0	R0ST1200
	FLAMPD=.5*(1.+COS(PHI))	R0ST1210
	TKEXIT = .25	R0ST1220
	CI =DM-2.*TKEXIT	R0ST1230
	EPSC = N23	R0ST1240
	AMAX =(DI/2.)*2*PI	R0ST1250
	PP= PC*FSYLD	R0ST1260
	MCASE= IFIX(CASEM+.1)	R0ST1270
	CALL MATLS(MCASE,TCASEF,RHO,FTU,FTY,IND)	R0ST1280
	IF(INC .NE. 0) GO TO 135	R0ST1290
	TCYLU =FSULT*PC *D /(FTU*2.)	R0ST1300
C		R0ST1310
	TCYLY =FSYLD*PC *D /(FTY*2.)	R0ST1320
	TCYLT =AMAX1(TCYLU,TCYLY)	R0ST1330
	TC = AMAX1(TCYLT,TMIN)	R0ST1340
	A=PI*(C/2. - TC - N117) **2	R0ST1341
	TAHU =FSULT*PC *N23*D/FTU/4.	R0ST1350
	TAHY =FSYLD*PC *N23*D/FTY/4.	R0ST1360

TAHT = AMAX1(TAHU,TAHY)	R0ST1370
TAH = AMAX1(TAHT,TMIN)	R0ST1380
IF (N2.EQ. N23) GO TO 136	R0ST1390
TFHU = FSULT*PC *N2 *D/FTU/4.	R0ST1400
TFHY = FSYLD*PC *N2 *D/FTY/4.	R0ST1410
TFHT = AMAX1(TFHU,TFHY)	R0ST1420
TFH = AMAX1(TFHT,TMIN)	R0ST1430
GO TO 142	R0ST1440
136 TFH = TAH	R0ST1450
142 LOOP1 = 1	R0ST1460
1427 IF (IEX.EQ.0) GO TO 143	R0ST1470
PEPC = PA/PC	R0ST1480
EPS=((GAM+1.)/2.)*((1./(GAM-1.))*(PEPC)**(1./GAM) *	R0ST1490
1 SQRT ((GAM+1.)/(GAM-1.))*(1. - (PEPC)**((GAM-1.)/GAM)))	R0ST1500
EPI = 1./EPS	R0ST1510
CFV = FLAMBDA * SQRT(2.*GAM**2/(GAM-1.))*(2./(GAM+1.))*((GAM+1.)/	R0ST1520
1(GAM-1.)) * (1.-PEPC**((GAM-1.)/GAM))) + PEPC*EPI	R0ST1530
JK = 0	R0ST1540
R3 = D/2.0	R0ST1550
IF (EPI .LT. 2.5) GO TO 308	R0ST1560
CF = (CFV - PA/PC*EPI)*FJ	R0ST1570
EPIOLD = EPI	R0ST1580
ISP = CSTAR*CF/32.174	R0ST1590
AT = F/PC/CF	R0ST1600
AEXIT = EPI*AT	R0ST1610
PF = SQRT (AEXIT/PI)	R0ST1620
RT = SQRT (AT/PI)*((1. - 0.4*(1./COS(PHI) - 1.))	R0ST1630
EXLT = (RE-RT)/TAN(PHI)	R0ST1640
DELR = EXLT* TAN(BETA)	R0ST1650
REF = (PE+DELR)*COS(BETA)	R0ST1660
AEEF = REF**2*PI	R0ST1670
IF (AEEF .GT. AMAX*1.001) GO TO 302	R0ST1680
312 NBOSS = N77 * PP * D*N23*AT	R0ST1690
STHRSL = N78 * PP * AT**1.5	R0ST1700
XCONE = N79 * PP * AT**1.5*(EPI-2.5)/ SIN(PHI)	R0ST1710
INSRRG = N80 * (EPI*AT) **.5	R0ST1720
THININ = N81 * AT **.9	R0ST1730
SUM = PC**N83*TR**N84	R0ST1740
XINSUL = N82*AT*(EPI-2.5)/SIN(PHI)*FSYLD**N83*SUM	R0ST1750
1 *(CSTAR/32.174)**N85	R0ST1760
NOZWT = NBOSS + STHRSL + XCONE + INSRRG + THININ + XINSUL	R0ST1770
ZNFRNG = 0.	R0ST1780
RTH = SQRT(AT/PI)	R0ST1790
DN = SQRT(AT*N24/PI)	R0ST1800
IF (DN .GE. R3) DN = .8*R3	R0ST1810
EY = DN - SQRT(AT/PI)	R0ST1820
EYS = EY**2	R0ST1830
IF (EYS .GT. AT) EYS = AT - 1.0	R0ST1840
X1 = SQRT(AT-EYS)	R0ST1850
Z1 = SQRT((R3**2 - DN**2)/N23**2)	R0ST1860
X2 = EXLT*COS(BETA) + (RE + TKEXIT)*SIN(BETA)	R0ST1870
XRN = X1 + Z1*X2*PBELL	R0ST1880
C CC AND MCI	R0ST1890
FX = RTH*(2.- COS(PHI))	R0ST1900
C POSS	R0ST1910

I=3.*TAF	POST1920
CALL ZCYLLL(H,NBOSS,ON,0.,XII1,Z1,ZW1)	POST1930
WTH= STHPSL + INSRG + THININ	POST1940
CALL ZCONHH(X1,WTH,ON,HX,0.,0,XII2,Z2,ZW2)	POST1950
WEXT=XCONF + XINSUL	POST1960
X3=X2*PFLL	POST1970
CALL ZCONHH(X3,WEXT,PF,HX,X1,1,XII3,Z3,ZW3)	POST1980
ZNMIS= N121*X1	POST1990
Z(18)=(ZW1+ZW2+ZW3+ZNMIS)/(NBOSS+WTH+WEXT+N121) + 71	POST2000
XIND7 = XII1+XII2+XII3 + (Z1-Z(18))*2*NBOSS + (Z2-Z(18))*2*WTH	POST2010
1 + (Z3-Z(18))*2*WEXT + (X1-Z(18))*2*N121	POST2020
ZW(18)=7(18)*NOZWT	POST2030
Z(19)=0.0	POST2040
ZW(19) = 0.0	POST2050
XII(19)= 0.0	POST2060
GO TO 144	POST2070
308 IND = 9	POST2080
GO TO 307	POST2090
304 IND = 10	POST2100
307 IF (IPRINP .GT. 0) WRITE(6,305) AMAX,AEXIT,AT,EPI	POST2110
305 FORMAT(28H ERROR CALCULATING EXIT AREA /2X,4E20.6)	POST2120
GO TO 22	POST2130
302 RMAX =DI/2.	POST2140
AA = RMAX/ COS(BETA)	POST2150
XX = (RMAX-RT/COS(BETA)) /TAN(PHI + BETA)	POST2160
YY = XX*TAN(BETA)	POST2170
CLNX = XX + RMAX*TAN(BETA)	POST2180
DELR = CLNX*YY/XX	POST2190
RE = AA- DELR-TKEXIT	POST2200
AFXIT= RE*RE*PI	POST2210
303 JK = JK + 1	POST2220
IF (JK .GT.30) GO TO 304	POST2230
EPI = AEXIT/AT	POST2240
IF (EPI .LT. 2.5) GO TO 308	POST2250
IF (ABS(EPOLD/EPI -1.0).LT. .001) GO TO 311	POST2260
EPOLD = EPI	POST2270
CALL NOZEX(GAM,EPI,PHI,PEPC,CFV,IND)	POST2280
PE = PEPC*PC	POST2290
IF(IND.NE.0) GO TO 9023	POST2300
GO TO 303	POST2310
311 PT = SQRT (AT/PI)*(1. - 0.4*(1./COS(PHI) -1.))	POST2320
XX = (RMAX-RT/COS(BETA)) /TAN(PHI + BETA)	POST2330
YY = XX*TAN(BETA)	POST2340
CLNX = XX + RMAX*TAN(BETA)	POST2350
DELR = CLNX*YY/XX	POST2360
ISP= CSTAR*CF/32.174	POST2370
EXLT = CLNX	POST2380
GO TO 312	POST2390
C ITERATION LOOP	POST2400
143 CALL RAMNOZ(D, IND,IPRINT,CSTAR)	POST2410
IF(IND.NE.0) GO TO 9013	POST2420
ZNFRNG = RHO*PI*D*(.05*XRN + .1)	POST2430
NOZWT = NOZWT + N121 + ZNFRNG	POST2440
IF(III(11).EQ. 0) GO TO 144	POST2450
C NOZZLE FAIRING ITEM 19	POST2460

XAFT = LCYL + RR/N2	POST2470
CALL ZCYLL(XRN,ZNFRNG,RR,XAFT,X11(19),Z(19),ZW(19))	POST2480
144 ACX = PI*(.5*D-TC-N117)**2	POST2490
AFAT = WARD(10)	POST2500
APAT = (1.-ETAX)*AGX/AT	POST2510
IF (APAT.GT.AFAT) AFAT = APAT	POST2520
CMASS OF PROPELLANT FWD HEAD	POST2530
MPFH = RHOP * (2.09*(D*.5-TFH-N114)**2 * (.5*D/N2-TFH -N114) -	POST2540
1 .5*AFAT*AT*D/N2) - RHOP*VRFH	POST2550
CMASS OF PROPELLANT AFT HEAD	POST2560
MPAH1=RHOP*(2.09*(D*.5-TAH-N115)**2*(.5*D/N23-TAH-N115))	POST2570
MPAH = (MPAH1-RHOP*AFAT*AT*(.5*D/N23-TAH-N115))*FMPAH	POST2580
A = PI*(D/2.-TC-N117)**2	POST2590
CMASS OF PROPELLANT CYLINDER	POST2600
MPCYL =MP-MPFH-MPAH	POST2610
IF(MPCYL) 2001,2002,2002	POST2620
2001 MPCYL =0.	POST2630
KKK=KKK+1	POST2640
2002 LCYL=MPCYL/(RHOP*(A-AFAT*AT))	POST2650
7 TB = MP*ISP/F	POST2660
C FORWARD HEAD WEIGHTS	POST2670
IF (N2-1.) 180,175,180	POST2680
175 MEMSTR = N1*RHO* TFH *(PI*D*D/2.-N3*AT)	POST2690
INSUL = N4*N114*1.5708*(D-2.*TFH)**2	POST2700
GO TO 185	POST2710
180 SAY1 = SQRT (1.-1./(N2**2))	POST2720
SAY = ALOG ((1.+ SAY1)/(1.-SAY1))	POST2730
MEMSTR = N1*RHO*TFH*(D**2 * (.7854 + .3925/(N2**2 *SAY1) *	POST2740
1 SAY) - N3 *AT)	POST2750
INSUL=N4*N114*((D-2.*TFH)**2*(.7854+.3925*SAY/SAY1/N2**2)-N3*AT)	POST2760
185 IBOSS =4.5*N9*TFH *RHO * AT	POST2770
IGNITR = N10 *(LCYL +D/N2)*.01766*(AFAT*AT)**.5 + N11	POST2780
FCHDWT= MEMSTR + INSUL + IBOSS+ IGNITR + N13	POST2790
C CYLINDER WEIGHTS	POST2800
MEMSTC = PI *RHO* TC*D *LCYL	POST2810
LINER = N117*N4*PI*(D-2.*TC)*LCYL	POST2820
TCIM = N117	POST2830
TCIA = N117	POST2840
CYLWT = MEMSTC+LINER+N21	POST2850
C AFT HEAD WEIGHTS	POST2860
TAHIA = N115	POST2870
TAHIM = 2.*TAHIA-TCIM	POST2880
DN = SQRT(1.27323*EPSC*AT)	POST2890
IF (N23-1.) 190,187,190	POST2900
187 MEMSTA = 4.*N22*TAH*RHO *(PI*D*D/2.-EPSC* AT)	POST2910
INSULA = N4*TAHIA*PI*((D-2.*TAH)**2/2.-DN**2/4.)	POST2920
GO TO 195	POST2930
190 SAY1= SQRT(1.-1./(N23**2))	POST2940
SAY = ALOG ((1.+ SAY1)/(1.-SAY1))	POST2950
MEMSTA = N22*TAH*RHO *(D**2 * (.7854 + .3925/(N23**2 * SAY1)*	POST2960
1 SAY) -EPSC*AT)	POST2970
INSULA = N4*TAHIA*((D-2.*TAH)**2*(.7854+.3925*SAY/SAY1/N23**2)	POST2980
1 -PI*DN**2/4.)	POST2990
195 BOSS = 4.* N30 * TAH * RHO *D	POST3000
511 AFTHGW = MEMSTA + BOSS + INSULA + N33	POST3010


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C          MISSILE WEIGHTS                                ROST3020
C CLD  FORSKT = N34 + 2.*N35*TC*RHO *D          +N36 *D**2 * ( GMAX*ML/N37* ( ROST3030
      FORSKT = N34 +      N35*TC*RHO *D*PI      +N36 *D**2 * ( GMAX*ML/N37* ( ROST3040
      1  .215*(LCYL+D/N2)/D+1.) )** .5 +DLFS*PI*D*TC*RHO                                ROST3050
C CLD  AFTSKT = N38 + 2.*N39*TC*RHO*D**2+N40*D**2*((ML+MP/2.)/N37                ROST3060
      AFTSKT = N38 + PI*N39*TC*RHO*D          +N40*D**2*((ML+MP/2.)/N37                ROST3070
      1  * (.215*(LCYL +D/N23)/D + 1.) )** .5                                ROST3080
C          TOTAL INFRT WEIGHT                                ROST3090
      MF = FOHDWT + CYLWT + AFTHDW + FORSKT + AFTSKT + NO7WT + EXTWT                ROST3100
      MP*MF=MP*MF                                ROST3110
C          BUPNDUT WFIGHT                                ROST3120
      MR = MF + ML                                ROST3130
C          LAUNCH WEIGHT                                ROST3140
      MOC = MB + MP                                ROST3150
      WRATI = DELVR/ISP/32.174                    ROST3160
      WRAT= 2.71828**WRATL                        ROST3170
      MP = (WRAT-1.)*(MB)                        ROST3180
C          LAUNCH THRUST-TO-WEIGHT RATIO                ROST3190
      FIMOC = F/MOC                                ROST3200
      IF(J)2011,2011,255                            ROST3210
255 F = FIMO *MOC                                ROST3220
      LCOPI = LOOP1 + 1                            ROST3230
      IF(ABS(FIMOC-FIMO)-.01) 2011,2011,2003        ROST3240
2003 IF (KKK-4) 2015,2006,2006                    ROST3250
2015 IF (LOOP1.GT.25)WRITE(6,BADRUN)                ROST3260
      IF (LOOP1-35 ) 1427,1427,258                ROST3270
2006 IF (IPRINP.NE.0) WRITE(6,2007) SDVI,MPFH,MPAH,ISP,ME ROST3280
2007 FORMAT(46H NEGATIVE CYLINDER LENGTH,DELIVERED DELTA V = ,F10.3, ROST3290
      1 17H PROP IN FWD HEAD,F10.5,17H PROP IN AFT HEAD,F10.5,/, ROST3300
      2 5H ISP=, F10.5,17HBURN OUT WEIGHT =,F10.5) ROST3310
      IND = 7                                       ROST3320
      GO TO 22                                     ROST3330
258 IF ( IPRINP .GT. 0 ) WRITE(6,2012) FIMOC        ROST3340
      IND=5                                         ROST3350
      GO TO 22                                     ROST3360
2012 FORMAT(45H UNABLE TO FIND THRUST TO WEIGHT VALUE,FIMOC=,F10.5) ROST3370
2011 SDVI=      ISP*32.174*ALOG(MOC/MR)            ROST3380
      LOOP2=LOOP2+1                                ROST3390
      IF (ABS(SDVI -DELVR)- .001*DELVR) 2004,2004,2116 ROST3400
2116 IF (KKK-4) 2005,2006,2006                    ROST3410
2005 IF ((LOOP2+LOOP1).GT.90 .AND. ( IPRINP.NE.0)) WRITE(6,BADRUN) ROST3420
      IF (LOOP2+LOOP1-100)142,142,2008            ROST3430
2010 FORMAT(50H UNABLE TO CONVERGE AFTER 100 ITERATIONS,DELTA V =, ROST3440
      1 F10.3)                                     ROST3450
2008 IF ( IPRINP .GT. 0 )WRITE(6,2010) SDVI        ROST3460
      IND = 4                                       ROST3470
      GO TO 22                                     ROST3480
2004 CONTINUE                                       ROST3490
      SAY = RHOP * PI *(D/2. -TC -N117) * (LCYL +D*.5/N2 +D*.5/N23)*2. ROST3500
      RP = F/ISP/SAY                                ROST3510
C          MOTOR MASS FRACTION                            ROST3520
      MMF = MP/(MP + MF)                            ROST3530
      SAW = (D/2.-TFH) **2 * (D *.5/N2 -TFH)        ROST3540
      SAW1 = ( D/2.- TAH)**2 * (D*.5/N23 -TAH)        ROST3550
C          VOLUMETRIC LOADING EFFICIENCY                ROST3560

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	VOLLD = (MP/RHOP) / (PI *LCYL*(D/2.-TC)**2 +2.09*(SAW +SAW1))	POST3570
	PHQ=PHI*57.2957795	POST3580
	ITOT= F*TB	POST3590
	IMPWT = ITOT / MQC	POST3600
	MPA = MP	POST3610
	LT = LCYL + D*.5/N2+DLFS+XRN	POST3620
	IF(III(11).EQ.0) GO TO 710	POST3630
C	IGNITER BOSS ITEM 1	POST3640
	R= SQRT(AT/PI/2.)	POST3650
	F= TFH*3.	POST3660
	RID =R-F	POST3670
	XC= H/2.	POST3680
	CALL ZCYLHH(H,IBOSS,R,RID,XD,XII(1),Z(1),ZW(1))	POST3690
C	FWD CLOSURE ITEM 2	POST3700
	RBOSS=P	POST3710
	RINS= PR-TFH	POST3720
	IF(N2.EQ.1.0) GO TO 711	POST3730
	CALL ZELPLL(N2,RHO,RF,RBOSS,TFH,0.0,1,XII(2),Z(2),ZW(2))	POST3740
	ZW(2) = Z(2)* MEMSTR	POST3750
C	FWD INSULATION ITEM 5	POST3760
	EF=RINS/(RR/N2-TFH)	POST3770
	CALL ZELPLL(EF,N4, RINS,RBOSS,N114,TFH,1,XII(5),Z(5),ZW(5))	POST3780
C	FWD PROPELLANT ITEM 3	POST3790
512	RHOLF = SQRT(AFAT*AT/PI)	POST3800
	CALL ZELPSS(N2,RHOP,RR,RHOLF,0.,1,XII(3),Z(3),ZW(3))	POST3810
	ZW(3) = Z(3)* MPFH	POST3820
C	IGNITER ITEM 4	POST3830
	Z(4) = RBOSS	POST3840
	ZW(4) = RBOSS*IGNITR	POST3850
	XII(4)= 0.0	POST3860
C	MISCELLANEOUS FWD WTS ITEM 6	POST3870
	WT(6) = N13	POST3880
	XII(6)= 0.0	POST3890
	Z(6)=.5	POST3900
	ZW(6)= Z(6)*N13	POST3910
C	CYL CASE ITEM 7	POST3920
	XLF=RR/N2	POST3930
	CALL ZCYLLL(LCYL,MEMSTC,RR,XLF,XII(7),Z(7),ZW(7))	POST3940
C	CYL INSULATION ITEM 8	POST3950
	RI=RR-TC	POST3960
	CALL ZCYLLL(LCYL,LINER,RI,XLF,XII(8),Z(8),ZW(8))	POST3970
C	MISCELLANEOUS CYL WTS ITEM 9	POST3980
	WT(9) = N21	POST3990
	Z(9) = LCYL/2. + XLF	POST4000
	ZW(9)= Z(9)*WT(9)	POST4010
	XII(9) = 0.0	POST4020
C	CYL PROPELLANT ITEM 10	POST4030
	RPC = RR-TC-N114	POST4040
	CALL ZCYLHH(LCYL,MPCYL,RPC,RHOLF,XLF,XII(10),Z(10),ZW(10))	POST4050
C	AFT CLOSURE ITEM 11	POST4060
	XAFT= XLF+LCYL	POST4070
	RAFT= DN/2.	POST4080
	RINS = PR -TAH	POST4090
	IF(N23.EQ.1.0) GO TO 513	POST4100
	CALL ZELPLL(N23,RHO,RR,RAFT,TAH,XAFT,0,XII(11),Z(11),ZW(11))	POST4110

	ZW(11) = MEMSTA*Z(11)	POST4120
C	AFT INSULATION ITEM 12	POST4130
	EF= PINS/(RR/N23- TAH)	POST4140
	CALL ZFIPLL(EF,N4,RINS,RAFT,TAHIA,XAFT,0,XII(12),Z(12),ZW(12))	POST4150
	ZW(12) = INSULA*Z(12)	POST4160
C	AFT PROPELLANT ITEM 13	POST4170
514	DELAP =MPAH1-MPAH	POST4180
	HOLAFT = SQRT(DELAP/P I/RHOP/RR*N23)	POST4190
	RAP = RR- TAH-TAHIA	POST4200
	EEP = RAP/(RR/N23-TAH-TAHIA)	POST4210
	CALL ZELPSS(EEP,RHOP,RAP,HOLAFT,XAFT,0,XII(13),Z(13),ZW(13))	POST4220
	ZW(13) = Z(13)*MPAH	POST4230
C	AFT BOSS ITEM 14	POST4240
	H=3.*TAH	POST4250
	HH= RR/N23	POST4260
	Y=HH*(1.-SQRT(1.-(RAFT/RR)**2))	POST4270
	ACL = H-Y	POST4280
	XDNQZ=XAFT+ACL	POST4290
	CALL ZCYLLL(H,BOSS,RAFT,XDNQZ,XII(14),Z(14),ZW(14))	POST4300
C	MISCELLANEOUS AFT WTS ITEM 15	POST4310
	XII(15) =0.0	POST4320
	Z(15) = XAFT+ ACL/2.	POST4330
	ZW(15) = Z(15)* N33	POST4340
	WT(15) = N33	POST4350
C	FOPESK IPT ITEM 16	POST4360
	FLSKT =N35	POST4370
	IF(N35.LE.0.C) FLSKT= RR/N2	POST4380
	H = FLSKT+ DLFS	POST4390
	XSKT = FLSKT- DLFS	POST4400
	CALL ZCYLLL(H,FOPSKT,RP,XSKT,XII(16),Z(16),ZW(16))	POST4410
C	AFT SKIPT ITEM 17	POST4420
	ALSKT = N39	POST4430
	IF(N39.LE.0.C) ALSKT= RR/N23	POST4440
	CALL ZCYLLL(ALSKT,AFTSKT,RR,XAFT,XII(17),Z(17),ZW(17))	POST4450
C	NOZZLE ITEM 18	POST4460
	WT(18) = NOZWT - ZNFRNG	POST4470
	Z(18) = ZNOZ + XAFT	POST4480
	ZW(18) = WT(18)*Z(18)	POST4490
	XII(18)= XINOZ	POST4500
	WTT =0.C	POST4510
	ZTT =0.C	POST4520
	DO 501 I=1,19	POST4530
	WTT = WTT +WT(I)	POST4540
501	ZTT =ZTT+ ZW(I)	POST4550
	ZTE = ZTT - ZW(3) - ZW(10) - ZW(13)	POST4560
	ZPOOST = ZTT/WTT + DLFS	POST4570
	WTE = WTT - WT(3) - WT(10) - WT(13)	POST4580
	ZEMTY = ZTE/WTE + DLFS	POST4590
	XITOT =0.0	POST4600
	XMOV =0.0	POST4610
	XMT = 0.0	POST4620
	DO 502 I=1,19	POST4630
	XITOT = XITOT + XII(I)	POST4640
	XMT = XMT +(ZEMTY-Z(I))*2*WT(I)	POST4650
502	XMOV = XMOV +(ZPOOST-Z(I))*2*WT(I)	POST4660


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XIIBST = XITOT + XMOV
XFF=(ZFMITY-Z(3))*2*WT(3)+(ZEMTY-Z(10))*2*WT(10)+(ZEMTY-Z(13))*
12*WT(13)
XIFF = XII(3) + XII(10) + XII(13)
XIIMT = XMT-XFF + XITOT -XIFF
710 IF(NOUT)712,275,712
711 CALL ZSPRLL(RHO,RR,TFH,RBOSS,0.0,1,XII(2),Z(2),ZW(2))
CALL ZSPRLL(N4,RINS,N114,RBOSS,TFH,1,XII(5),Z(5),ZW(5))
GO TO 512
513 CALL ZSPRLL(RHO,RR,TAH,RAFT,XAFT,0,XII(11),Z(11),ZW(11))
CALL ZSPRLL(N4,RINS,TAHIA,RAFT,XAFT,0,XII(12),Z(12),ZW(12))
GO TO 514
712 TMOTOR = MP + ME
IF(IEF.NE.1) GO TO 713
CFVA = CFV* FJ
ISPV = CSTAR*CFVA/32.174
713 QSUB = PSUB*100.
QPELL = 100.*PRELL
FWHLT = D/N2*.5
CASEWT = MEMSTR+MEMSTA+MEMSTC
WTITOT = INSUL +INSULA+LINER
WROSS = IBOSS + ROSS
WCCN = N13 + N21+ N33
FOADWT = FOPDWT + FORSKT
TOMIS = FORSKT + AFTSKT
AFTADW = AFTHDW + AFTSKT
FWT = FOADWT+MPFH
CWT = CYLWT +MPCYL
AWT = AFTADW + MPAH
THKC = .3
TC = TIEC*2.
CH = FOADWT + CYLWT + AFTADW
IF(IPRINP.EQ.0) GO TO 275
C PRINT BOOSTER DATA
WRITE(6,701)
WRITE(6,702)MP,F ,CF ,ME,FIMOC, TMOTOR,SDVI,CFVA,
IML,ITOT,TB ,MOC,ISP ,RB ,MB,ISPV,AFAT
WRITE(6,703)D,PP,MMF,LCYL,PC ,VOLLD,FWHLT,PAP ,IMPWT,XPN,PF,
1 BETA,DLFS,LT
IF ( IPRINP .LE. 0 ) GO TO 275
IF(III(11).GT. 0)
1WRITE(6,726) ZBOOST,ZEMTY,XIIBST,XIIMT
WRITE(6,704) IB
WRITE(6,705) MEMSTR,MEMSTC,MEMSTA,CASEWT,INSUL,LINER,INSULA,WTITOT
2,IROSS,ROSS,WROSS,IGNITR,
3 IGNITR,FORSKT,AFTSKT,TOMIS,N13,N21,N33,WCCN,
4 FOADWT,CYLWT,AFTADW,CH,MPFH,MPCYL,MPAH,MP,NOZWT,FWT,CWT,AWT,
5 TMOTOR
WRITE(6,706) N114,TCIA,TAHIA,TCIM,TAHIM,TFH,TC,TAH
WRITE(6,714 ) FTU,FTY
714 FORMAT(6X,23FULTIMATE CASE STRENGTH ,F8.0,2X21HYIELD CASE STRENGTH
1 ,F8.0)
WRITE(6,707)TMIN
707 FORMAT(6X, 40CTHE MINIMUM ALLOWABLE CASE THICKNESS WAS,F9.5/)
IF(IEF.NE.0) GO TO 750

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WRITE(6,708) POST5220
 WRITE(6,709)WG,XG,TG,QBELL,WA,X1,DELA,QSUR,WTB, PHO,WC, POST5230
 1EPI,WTI,XI, X3,FPSC,71,AT,THICK,X1,WRN,XRN,TAM, 7NFRNG,N121, POST5240
 2 NOZWT POST5250
 WRITE (6,720) Y1,THED,RC POST5260
 GO TO 275 POST5270
 750 WRITE (6,755) POST5280
 WRITE(6,751)NBOSS,STHRSL,XCONE,INSRRG,THININ,XINSUL,NOZWT,XRN POST5290
 755 FORMAT(//4X,6HNOZZLE) POST5300
 WRITE(6,752) QBELL,PHO,EPI,EPSC,AT POST5310
 752 FORMAT(2X,52H BELL HALF ANG EPI ENT RATIO THROAT APEABOST5320
 1/2X,8F10.5//) POST5330
 751 FORMAT(2X,77H NOZZLE THRCAT EXIT INSERT THROAT EXPOST5340
 1IT CONE TOTAL TOTAL /6X,74HBOSS STRUCTURE STRUCTURE RETAINERPOST5350
 2R ASSEMBLY INSULATN WEIGHT LENGTH/2X,8F10.5//) POST5360
 701 FORMAT(4X,22HROSTER SIZING DETAILS , POST5370
 1 5X,7HWEIGHTS, 20X POST5380
 2,11HPERFORMANCE,13X'INTERNAL BALLISTICS') POST5390
 702 FORMAT(6X,12HPROPELLANT ,F10.2,5X'THRUST ',F10.2,5X'CF',9X,F9.3POST5400
 1/ POST5410
 16X,12HINERTS ,F10.2,5X'THRUST/WT',F10.2/ POST5420
 26X,12HTOTAL MOTOR ,F10.2,5X'DELTA VI ',F10.3,5X'CF VACUUM ',F9.3/POST5430
 36X,12HPAYLOAD ,F10.2,5X'TOTAL ',F10.2,5X'BURN TIME ',F9.3/POST5440
 46X,12HLAUNCH WT ,F10.2,5X'ISP DEL ',F10.3,5X'BURN RATE ',F9.3/POST5450
 56X,12HPURN OUT WT ,F10.2,5X'ISP VAC ',F10.3,5X'PORT/THROAT',F9.3)POST5460
 703 FORMAT(5X,10HDIMENSIONS,17X,5HPRESSURES ,15X,13HMISCELLANEOUS / POST5470
 16X,12HDIAMETER ,F10.3,5X'DESIGN ',F10.2,5X'MMF ',F9.4/POST5480
 26X,12HLT CYL ,F10.3,5X'CHAMBER ',F10.2,5X'VOL LOADING',F9.4/POST5490
 36X,12HLT FWD HEAD ,F10.3,5X'AMBIENT ',F10.2,5X'((I TOT)/WT ',F9.2/POST5500
 46X,12HLT NOZZLE ,F10.3,5X'EXIT ',F10.2,5X,12HMCZ CANT ANG , POST5510
 1 F9.2 /6X,10HSKIRT EXTN , POST5520
 5 F12.3/6X,8HTOTAL LT,F14.3) POST5530
 726 FORMAT(6X,12HCG LOADED ,F10.3,5X,9HCG EMPTY ,F10.3,5X,11HMOI LOADPOST5540
 1ED ,F9.0,5X,11H,MOI EMPTY ,F9.0) POST5550
 704 FORMAT(14X,28HBREAKDOWN OF CHAMBER DESIGN ,15X, 9H MATERIAL,3A4/ POST5560
 127X,42HFORWARD CYLINDER AFT TOTAL /5X,7HWEIGHTS) POST5570
 705 FORMAT(6X14H STRUCTURE ,4F12.3/ POST5580
 16X,14H INSULATION ,4F12.3/6X,14H BOSS ,F12.3,12X,2F12.3/POST5590
 26X,14H IGNITER ,F12.3,24X,F12.3 / POST5600
 36X,14H SKIRTS , F12.3,12X,2F12.3/ POST5610
 46X,14H CONSTANTS ,4F12.3/6X,14HTOTAL CHAMBER ,4F12.3 / POST5620
 56X,14HPROPELLANT ,4F12.3/6X,14HNOZZLE WEIGHT ,36X,F12.3/ POST5630
 65X,15HTOTAL WEIGHT ,4F12.3) POST5640
 706 FORMAT(5X,1CHTHICKNESS /6X,10HINSULATION / POST5650
 16X,4H AVG,10X,3F12.5 /6X,4H MAX,22X,2F12.5/6X,4H CASE,10X,3F12.5) POST5660
 708 FORMAT(4X26HBREAKDOWN OF NOZZLE DESIGN /22X,50HWEIGHT LENGTH POST5670
 1THICKNESS DESIGN CONDITIONS /24X,24HLBS INCHES INCHES/ POST5680
 25X,6HINSERT) POST5690
 709 FORMAT(5X,15H GRAPHITE ,3F10.3,3X,12HPERCENT BELL ,7X,F9.3/ POST5700
 25X,15H ARLATIVE MATI ,3F10.3,3X,19HPERCENT SUBMERGED F9.3/ POST5710
 45X,15H THROAT BAND ,F10.3,23X, 19H HALF ANGLE ,F9.3/POST5720
 55X,15H CLAMP ,F10.3, 23X,19H EXPANSION RATIO ,F9.3/POST5730
 65X,15H INSERT TOTAL ,F10.3,F10.3/ POST5740
 75X,15H ENTRANCE ,10X,F10.3,13X, 19H ENTRANCE RATIO ,F9.3/POST5750
 85X,15H AFT DOME ,10X,F10.3,13X, 19H THROAT AREA ,F9.3/POST5760

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85X,15H CLAMP ,10X,F10.3/ POST5770
95X,15H EXIT CONE ,10X,F10.3/5X,15H RAMJET NOZZLE ,F10.3,2F10.3 POST5780
X /6X,14H NOZZLE FAIRING ,F10.3, POST5790
X /6X,14H MISCELLANEOUS ,F10.3, POST5800
1 /5X,15H TOTAL NOZ ASSY ,F10.3) POST5810
720 FORMAT(5X,32H RAMJET NOZZLE ENTRANCE GEOMETRY / 5X, POST5820
133H AFT DOME/ENTRANCE TANGENT RADIUS ,F8.3,13H ENTRANCE ARC ,F7.2, POST5830
2 8H DEGREES /5X,26H NOZZLE RADIUS OF CURVATURE ,F8.3,17H NOZZLE FLARE POST5840
3T 0.20) POST5850
275 SCWT=(WTI + IGNITR/2. + MP ) * FACTOR POST5860
IF ( II(1) .NE. 41 ) GO TO 8118 POST5870
WMC=CASEWT+WBOSS+TOMIS POST5880
MPX=MP POST5890
NOZWTX=NOZWT POST5900
VPI=WTITOT/N4 POST5910
YIX=Y1 POST5920
R5X=SQRT(A5A3) * D/2. POST5930
8118 CONTINUE POST5940
CCOM=C POST5950
CASEMX=CASEM POST5960
MP= MP*FACTOR POST5970
MPMF= MPMF*FACTOR POST5980
PEXIT = EPI * AT / 144. POST5990
RTHVAC = F * ISPV / ISP POST6000
RTHVAC = RTHVAC * FACTOR POST6010
REXIT = REXIT * FACTOR POST6020
RISPV = ISPV POST6030
RPOWP = MP POST6040
SEXIT = RR * RR * PI * A6A3 / 144. POST6050
CROPST = ( WTI + IGNITR/2. ) * FACTOR POST6060
CROPFE = MOC * FACTOR POST6070
CROPER = ME * FACTOR POST6080
RETURN POST6090
9013 IF ( IPRINP .LE. C ) RETURN POST6100
WRITE (6,9003) POST6110
9003 FORMAT(16H ERROR IN RAMNOZ) POST6120
22 WRITE (6, 12 ) IND POST6130
WRITE(6,652) APE2,ML,A6Z3,A5Z3,PA POST6140
WRITE(6,RADRUN) POST6150
CALL PDUMP(WG,ISPV,5) POST6160
RETURN POST6170
135 IF ( IPPINP .LE. 0 ) RETURN POST6180
WRITE (6,36) MCASE POST6190
36 FORMAT(26H ERROR IN SUBROUTINE MATLS ,15) POST6200
RETURN POST6210
9023 IF ( IPRINP .LE. C ) RETURN POST6220
WRITE (6,9024) GAM, EPI, PHI POST6230
9024 FORMAT(16H ERROR IN NOZEX ,3E20.6) POST6240
RETURN POST6250
END POST6260

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SUBROUTINE CDINLT
C NUK.CM-CGSM R.K.MCDONOUGH FIV/ERCD 10/18/73

CDIL0010
CDIL0020


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C SUBROUTINE FOR INLET DRAG
COMMON/OUTP1/ CDSKIN,CDPDIV,CDCCWL,CDPAFT,CDFDIV,CDFEWD,
1 OUTP8(8), CDPEWD, OUTDUM(20)
COMMON /RJDAT/ RJ4(4), ACA3, RJD44(4)
COMMON/PRINTR/ IPSM, IPIM(2), IAIR, IPUM(3)
COMMON /INLSTF/ AWEQ
COMMON /IPROP/ IND,IMIN,NEWPT,IRJOUT
COMMON /INDATA/ CDINL, CLALF,WEIGHT
COMMON /INDEX/ X1(12), DEL1,DEL2,DEL3,XMDES
COMMON/CODEXX/ ININ(16)
EQUIVALENCE (ININ(2),ITYPE),(ININ(15),NOUT)
COMMON/EXTERN/ ARR(20)
EQUIVALENCE (ARP(3),D3),(ARR(16),XMZERO),(ARR(17),XMRJTC)
COMMON / SUSDAT/ TX(44)
EQUIVALENCE (TX(33),SUSLT)
DATA C /0.01745325/
EQUIVALENCE (SPEF,A3),(AMACH,XMZERO,RM),(DBL,HBL YER),
1(XLBYD,FAIRFR),(AFFPRJ,AWDFG)
COMMON/INDATX/ HPROJ,HC,W,HBL YER,ANGLEL,ANGLEU,ANGCUB,ABLDIV,
1HPLDIV,XCHECK,XFRNG,XNAC ,XDIST ,AWET,AWETFF,DELEXT,ADIVWT,
2XLBYD,AFFPRJ,ACPROJ, TSTART,TFRNG, HP
COMMON /ALTDG/
1K1,ALT(24),SDTEMP(24),PRESS(24),ID(8)
COMMON /INCOMM/XLDUMP,XFRNG,XINLET,XTIPCL,STERM,TNCZL
DIMENSION TAB3(50),TABX(20),TABY(44), TABZ(22),FRCTN3(42)
DIMENSION TAB4(20)
DATA TABX/0.0, 0.0, 1.0, 0.480, 2.0, 1.740, 3.0, 2.46, 4.0, 2.99,
15.0, 3.32, 6.0, 3.72, 8.0, 4.25, 10.0, 5.00, 16.0, 5.60/
DATA TABY/0.0, 2.0, 0.10, 1.60, 0.20, 1.24, 0.30, 1.03, 0.40,
10.89, 0.50, 0.80, 0.60, 0.72, 0.70, 0.65, 0.80, 0.60, 0.90, 0.55,
21.0, 0.50, 1.25, 0.41, 1.5, 0.35, 1.75, 0.30, 2.0, 0.25, 2.5,
30.17, 3.0, 0.12, 4.0, 0.08, 5.0, 0.05, 10.0, 0.02, 100.0,
40.01, 1000.0, 0.0/
DATA TABZ/0.0, 0.135, 0.80, 0.135, 0.90, 0.144, 1.0, 0.195,
11.2, 0.190, 1.6, 0.167, 2.0, 0.140, 3.0, 0.092, 4.0, 0.065,
25.0, 0.048, 6.0, 0.037/
DATA TAB3 / 0.,0.,.05,.016,.1,.029,.15,.05,.2,.071,.25,.098,.3,
1 .122, .35,.151,.4,.18,.45,.212,.5,.247,.55,.283,.6,.317,.65,.36,
2 .7,.406,.75,.45,.8,.503,.85,.554,.9,.606,.95,.667,1.,.73,1.05,
3 .794,1.1,.864,1.15,.931,1.2,1.005 /
CALCULATE THE INLET DRAG
DATA FRCTN3/ 0.0, 0.0, 1.0, 0.5, 0.973, 0.75,
1 0.945, 1.0, 0.915, 1.5, 0.834, 2.5,
2 0.65, 3.0, 0.574, 4.0, 0.445, 5.0,
3 0.353, 6.0, .29, 80000., 0.0, 1.0,
4 0.5, 0.978, 0.75, 0.96, 1.0, 0.933,
5 1.5, 0.858, 2.5, 0.68, 3.0, 0.61,
6 4.0, 0.491, 5.0, 0.4, 6.0, 0.347/
DATA TAB4/ 0.0, 0.0, 10.0, 0.20, 20.0, 0.37,
1 30.0, 0.5, 40.0, 0.67, 50.0, 0.80,
2 60.0, 0.87, 70.0, 0.92, 80.0, 0.98,
3 90.0, 1.00/
PYPX(A,R)=(7.*A**2 *R**2 -1.)/6.
XMSQD(A,R)=(36.*A**4 *R**2 -5.*((A*R)**2 -1.)*(7.*(A*R)**2 +5.))/
1((7.*(A*R)**2 -1.)*((A*R)**2 +5.))

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NAMLIST /QQ/ CDINL,CDPFWD,CDEFFWD,CDPDIV,CDFDIV,CDPAFT,CDSKIN,	CDIL0580
1 CDCOWL,REYNAC,AMACH,HP	CDIL0590
A3 = APR(12)*144.	CDIL0600
SREF=A3	CDIL0610
AC=ACA3 * A3	CDIL0620
ACPER=AC/XNINLT	CDIL0630
KRYXIN = 0	CDIL0640
CDSKIN=0.	CDIL0650
CDCOWL=0.	CDIL0660
XNINLT = ITYPE	CDIL0670
CDPFWD=0.	CDIL0680
CDEFFWD=0.	CDIL0690
CDPDIV=0.	CDIL0700
CDFDIV=0.	CDIL0710
CDPAFT=0.	CDIL0720
CALL TLUI(HP,ALT,K1,PRESS,PO,IND)	CDIL0730
IF(IND.NE.0) GO TO 38	CDIL0740
CALL TLUI(SOTEMP,TO)	CDIL0750
ALK=HP/1000.	CDIL0760
RHOAIR=PO/(53.3*TO)	CDIL0770
RHOSLG=RHOAIR/32.2	CDIL0780
XMU=(0.302/1000000)*((392.+198.)/(TO+198.))*(TO/392.)*1.5	CDIL0790
VSOND=49.02*SQR(TO)	CDIL0800
REYFTM=VSOND*RHOSLG/XMU	CDIL0810
REYFT=REYFTM*XMZERO	CDIL0820
REY=REYFT*(XCHECK/12.)	CDIL0830
IF(ININ(1).GT.49.AND.XMZERO.LE.1) GO TO 502	CDIL0840
CALCULATE THE COWL PRESSURE COEFFICIENT	CDIL0850
IF((XMZERO.GT.XMRJTO) .AND. (XMZERO.GE.XMDES)) GO TO 174	CDIL0860
DELEND=DEL1+DEL2+DEL3	CDIL0870
DELLIP=DELEXT-DELEND	CDIL0880
CPLIP = 0.0	CDIL0890
IF (XMZERO .LT. XMRJTO) GO TO 50	CDIL0900
C SHOCKS OUTSIDE INLET. HAVE POSSIBLY 4 SHOCKS. TWIS RETURNED IN DEG.	CDIL0910
CALL THETA(DEL1,XMZERO,TW,IND)	CDIL0920
IF(IND.NE.0)GO TO 49	CDIL0930
TWR=TW*C	CDIL0940
PIPO=PYPX(XMZERO,SIN(TWR))	CDIL0950
XM1=SQR(XMSQD(XMZERO,SIN(TWR)))	CDIL0960
CALL THETA(DEL2,XM1,TW,IND)	CDIL0970
IF(IND.NE.0)GO TO 51	CDIL0980
TWR=TW*C	CDIL0990
P2P1=PYPX(XM1,SIN(TWR))	CDIL1000
P2PO=P2P1*PIPO	CDIL1010
XM2=SQR(XMSQD(XM1,SIN(TWR)))	CDIL1020
CALL THETA(DEL3,XM2,TW,IND)	CDIL1030
IF(IND.NE.0) GO TO 52	CDIL1040
TWR=TW*C	CDIL1050
P3P2=PYPX(XM2,SIN(TWR))	CDIL1060
P3PO=P2PO*P3P2	CDIL1070
XM3=SQR(XMSQD(XM2,SIN(TWR)))	CDIL1080
CHECK IF HAVE EXPANSION OF SHOCK OFF EXTERNAL COWL LIP	CDIL1090
IF (DELEXT.GT.DELEND) GO TO 53	CDIL1100
CPLIP=(P3PO-1.)/(.7*XMZERO**2)	CDIL1110
GO TO 50	CDIL1120

C GO TO 53 INDICATES SHOCK OFF COWL LIP AT XMZERO.LT.XMDES	CDIL1130
53 CALL THETA((DELEXT-DELEND),XM3,TW,IND)	CDIL1140
IF(IND.NE.0) GO TO 48	CDIL1150
TWR=TW*C	CDIL1160
P4P3=PYPX(XM3,SIN(TWR))	CDIL1170
P4P0=P3P0*P4P3	CDIL1180
CPLIP=(P4P0-1.)/(1.7*XMZERO**2)	CDIL1190
GO TO 50	CDIL1200
48 P4P3=PYPX(XM3,1.)	CDIL1210
P4P0=P4P3*P3P0	CDIL1220
CPLIP=(P4P0-1.)/(1.7*XMZERO**2)	CDIL1230
GO TO 50	CDIL1240
C GO TO 174 INDICATES ALL INLET SHOCKS INSIDE LIP	CDIL1250
174 CELLIP=DELEXT	CDIL1260
CALL THETA(DELLIP,XMZERO,TW,IND)	CDIL1270
IF(IND.NE.0)GO TO 49	CDIL1280
TWR=TW*C	CDIL1290
CPLIP= (XMZERO*XMZERO*(SIN(TWR)**2)-1.)*5./(3.*XMZERO**2)	CDIL1300
GO TO 50	CDIL1310
C GO TO 49 INDICATES DETACHED SHOCK. USE NCRMAL SHOCK PRESSURE RISE	CDIL1320
49 CPLIP= 5.*(XMZERO**2-1.)/(3.*XMZERO**2)	CDIL1330
GO TO 50	CDIL1340
51 P3P1=PYPX(XM1,1.)	CDIL1350
P3P0=P3P1*P1P0	CDIL1360
CPLIP=(P3P0-1.)/(1.7*XMZERO**2)	CDIL1370
GO TO 50	CDIL1380
52 P3P2=PYPX(XM2,1.)	CDIL1390
P3P0=P3P2*P2P0	CDIL1400
CPLIP=(P3P0-1.)/(1.7*XMZERO**2)	CDIL1410
GO TO 50	CDIL1420
502 CPLIP=0.	CDIL1430
50 CPPAR=CPLIP/2.	CDIL1440
IND = 0	CDIL1450
CALCULATE THE DIVERTER PRESSURE AND FRICTION DRAG	CDIL1460
CALCULATE THE DIVERTER PRESSURE DRAG	CDIL1470
IF(XMZERO.LT.XMRJTO) GO TO 3697	CDIL1480
THEDIV=10.*C	CDIL1490
IF(ITYPE.EQ.1) GO TO 4271	CDIL1500
ACD1 = ANGLEL + ANGLEU	CDIL1510
HTOT=HPROJ+HC+2.*TSTART	CDIL1520
XLDIV=0.5*HTOT/SIN(THEDIV)	CDIL1530
TOC=HTOT/(2.*XLDIV)	CDIL1540
GO TO 4272	CDIL1550
4271 XLDIV=0.5*(W+2.*TSTART)/SIN(THEDIV)	CDIL1560
TOC=(W+2.*TSTART)/(2.*XLDIV)	CDIL1570
ACD1 = ANGDU	CDIL1580
IF(ININ(1).GT.49.AND.XMZERO.LE.1) GO TO 4273	CDIL1590
4272 CONTINUE	CDIL1600
XMM = 0.882*RM	CDIL1610
XCDM = (RM*RM-1.0)/(RM*RM*TOC)**(2./3.)	CDIL1620
XCDMR = (XMM*XMM-1.0)/(XMM*XMM*TOC)**(2./3.)	CDIL1630
P = XCDM	CDIL1640
QL=0.	CDIL1650
IF (P.GT.-3.0)QL=0.1233*(P+3.0)	CDIL1660
IF (P.GT.-1.25)QL=0.21+0.828*(P+1.25)	CDIL1670

IF (P.GT.1.25)QL=2.28	CDIL1680
IF (P.GT.1.9)QL=2.28-2.085*(P-1.9)	CDIL1690
IF (P.GT.2.25)QL=1.55-0.314*(P-2.25)	CDIL1700
IF(P.GT.4.25) QL=.922-.0907*(P-4.25)	CDIL1710
CDTC = QL	CDIL1720
P = XCDMB	CDIL1730
QL=0.	CDIL1740
IF (P.GT.-3.0)QL=0.1233*(P+3.0)	CDIL1750
IF (P.GT.-1.25)QL=0.21+C.828*(P+1.25)	CDIL1760
IF (P.GT.1.25)QL=2.28	CDIL1770
IF (P.GT.1.9)QL=2.28-2.085*(P-1.9)	CDIL1780
IF (P.GT.2.25)QL=1.55-0.314*(P-2.25)	CDIL1790
IF(P.GT.4.25) QL=.922-.0907*(P-4.25)	CDIL1800
CDTCB=QL	CDIL1810
RD=D3/2.	CDIL1820
SBL = ADD1*((RD+DBL)**2-RD*RD)*C	CDIL1830
SDIV=APLDIV	CDIL1840
SOBL = SDIV-SBL	CDIL1850
CDPD = CDTCB*(SDIV/SREF)*(XMM/RM)**2*((TOC/(XMM*XMM))**(2./3.))	CDIL1860
CDPDIV=CDPD	CDIL1870
CDPC = 0.0	CDIL1880
HBLD=HBLDIV	CDIL1890
IF (DBL.LT.HBLD) CDPC=(CDPD/SDIV)*SBL+CDTC*(SOBL/SREF)*	CDIL1900
1 ((TOC/(RM*RM))**(2./3.))*2.0	CDIL1910
IF(DBL.LT.HBLD) CDPDIV=CDPC	CDIL1920
GO TO 4274	CDIL1930
4273 CDPDIV=0.	CDIL1940
4274 CONTINUE	CDIL1950
CALCULATE THE B/L DIVERTER SKIN FRICTION	CDIL1960
REYLDG=REY	CDIL1970
CFII=0.482/(ALOG10(REYLDG))**2.62	CDIL1980
CALL BLIN(2,10,FRCTN3(1),ALK,XMZERO,CFCFII)	CDIL1990
CDPDIV=CFII*CFCFII*ADIVWT/A3	CDIL2000
GO TO 1111	CDIL2010
3657 CONTINUE	CDIL2020
IF(ININ(1).GT.49) GO TO 912	CDIL2030
CALCULATE FWD FAIRING PRESSURE AND FRICTION DRAG	CDIL2040
C*****NACELLE FORWARD FAIRING DRAG*****	CDIL2050
FAIRFR=XLBYD	CDIL2060
IF(FAIRFR.LE.1.) FAIRFR=1.	CDIL2070
TNF=ATAN(1.0/(FAIRFR + FAIRFR))*57.296	CDIL2080
IF(RM.NE.1.0) GO TO 91C	CDIL2090
CALL LINE(10, TNF, TAB4(1), CDPF1)	CDIL2100
CDPFWD=CDPF1	CDIL2110
CDPFWD = CDPFWD * AWDFG / SREF	CDIL2120
GO TO 911	CDIL2130
910 CML=RM/FAIRFR	CDIL2140
CALL LINE(25,DML,TAB3,CDWW2)	CDIL2150
CDPFWD=(AWDFG)*(CDWW2/RM**2)/SREF	CDIL2160
IF (RM .LT. 1.0) CDPFWD = 0.0	CDIL2170
911 CONTINUE	CDIL2180
CALCULATE THE FRICTION DRAG ON THE FWD FAIRING	CDIL2190
REYFWD=REYFTM*XMZFRO*XDIST/12.	CDIL2200
CFFWDI=0.482/(ALOG10(REYFWD))**2.62	CDIL2210
CALL BLIN(2,10,FRCTN3(1),ALK,XMZERO,CFCFII)	CDIL2220

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      CFFWD=CFFWDI*CFCEII*AWETFF/A3
      GO TO 1111
912  CFPWD=C.
      CDFWD=0.
C AFT FAIR INC
1111  CNBTL=0.
      IF(IITYE.EQ.1) GO TO 7849
      STERM= (HBLDIV+W+2.*TSTART)
      PTOT=HC+HPROJ+2.*TSTART
      GO TO 7850
7849  STERM= (HBLDIV+HC+HPROJ+2.*TSTART)
      PTOT=W+2.*TSTART
7850  CONTINUE
      AEFF= PTOT*STERM
      DEFF=1.12838*SQR(AEFF)
      RLD = XFRNG / DEFF
      RMCR = .865 + .032 * RLD
C
      PETA=SQR(ABS(PM**2-1.))
      IF(RM.GT.1.1) GO TO 851
      THDBT=ATAN(0.5*DEFF/XFRNG)
      IF(RM -1.0) 1000,750,850
851  RLD8=(RLD + RLD)/PETA
      CALL LINE(10,RLD8,TABX,CDA)
      CDBTL= 0.25*CDA*(1.0/RLD)**2
800  CNBTL= CDBTL*AEFF/SREF
      BOVER=BETA/RLD
      CALL LINE(22,BOVER,TABY,CDBT)
      CNBTLX=CDBT/RLD**2
      IF (CNBTLX .GT. CNBTL) CNBTL = CNBTLX * AEFF / SREF
      GO TO 760
750  CONTINUE
      CDBTL=0.233/(THDBT*RLD*RLD)
      GO TO 800
850  CONTINUE
      CDBTL=0.233/(THDBT*PLD*RLD)
      IF(RLD.LE.2.) GO TO 900
      CALL LINE(10,RLD8,TABX,CDA)
      CDBPTL=0.25*CDA*(1.0/RLD)**2
      CNBTL= CDBPTL*AEFF/SREF
      GO TO 1200
900  CONTINUE
      BOVER=BETA/RLD
      CALL LINE(22,BOVER,TABY,CDBT)
      CDBPTL=CDBT/RLD**2
      XFRAC=10.*(1.1-RM)
      DELCD=CDBPTL-CDBTL
      CNBTL=CDBTL +XFRAC*DELCD
      CNBTL=CNBTL*AEFF/SREF
      GO TO 760
1000 CONTINUE
      IF ( RM .LE. RMCR ) GO TO 9728
      XFRAC=(RM-RMCR)/(1.0-RMCR)
      CDRAT=0.15*XFRAC + 1.47*XFRAC**2 -0.62*XFRAC**5
      CDBTL=0.233/(THDBT*PLD*RLD)

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CDIL2230
CDIL2240
CDIL2250
CDIL2260
CDIL2270
CDIL2280
CDIL2290
CDIL2300
CDIL2310
CDIL2320
CDIL2330
CDIL2340
CDIL2350
CDIL2360
CDIL2370
CDIL2380
CDIL2390
CDIL2400
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CDIL2690
CDIL2700
CDIL2710
CDIL2720
CDIL2730
CDIL2740
CDIL2750
CDIL2760
CDIL2770

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	CDNBTL=CDBT1*CDRAT*AEFF/SREF	CDIL2780
	GO TO 1200	CDIL2790
760	CALL LINE(11,RM,TAB7,CPR)	CDIL2800
	CDBASE=CPB*AEFF/SREF	CDIL2810
	IF(CDBASE.LT.CDNBTL) CDNBTL=CDBASE	CDIL2820
	GO TO 1200	CDIL2830
9728	CONTINUE	CDIL2840
	CDNBTL = 0.0	CDIL2850
1200	CONTINUE	CDIL2860
	CDPAFT=CDNBTL	CDIL2870
	REYNAC=REYFTM*XMZERO*XNAC/12.	CDIL2880
	CFIINC=0.482/(ALOG10(REYNAC))*2.62	CDIL2890
	CALL BLINE(2,10,FRCTN3(1),ALK,XMZERO,CFCFII)	CDIL2900
	CFCOMP=CFIINC*CFCFII	CDIL2910
	CDFINL=CFCOMP*(AWFQ-AWETFF)/A3	CDIL2920
	CDSKIN=CDFINL	CDIL2930
	CCOWL=CPBAR*ACPROJ/A3	CDIL2940
	CDINL =CDPFWC+CDFFWD+CDPDIV+CDFDIV+CDPAFT+CDSKIN+CCOWL	CDIL2950
	CDINL =CDINL *XNINLT	CDIL2960
	IF (NOUT .GT. 1) WRITE (6, QQ)	CDIL2970
6	FORMAT(13H INLET DRAG =,F10.5)	CDIL2980
	RETURN	CDIL2990
38	IF (NOUT .NE. 0) WRITE(6,39) HP	CDIL3000
39	FORMAT(46H ERROR TRYING TO FIND ALTITUDE DATA IN CDINLET ,E15.5)	CDIL3010
	RETURN	CDIL3020
	END	CDIL3030

	SUBROUTINE EXRAM	EXRM0010
	COMMON /COMVLS/ COM(51)	EXRM0020
	EQUIVALENCE (COM(7), WCOMM),	EXRM0030
1	(COM(8),VCOMI),	EXRM0040
2	(COM(9),RE),	EXRM0050
3	(COM(10),Y1),	EXRM0060
4	(COM(11),WNO7)	EXRM0070
	COMMON /FAILURE/ KFAIL	EXRM0080
	COMMON/COEXX/ II(16)	EXRM0090
	COMMON /MATTP/ IB(3)	EXRM0100
	COMMON /ERPRT/ ROMB(4),MUM,IARI(2)	EXRM0110
	COMMON /EXTERN/ AR (20)	EXRM0120
	EQUIVALENCE (AR(3),D3)	EXRM0130
	COMMON /EMPT/ HP,AMACH,ALF1,FARD	EXRM0140
	COMMON /RJCAT/ CFNRQ,CFNET,A5A3,A6A3,ACA3,SFC,BOSTWT,BOSTLT,	EXRM0150
1	BOSTPR	EXRM0160
	COMMON /IPROP/ IND,IMIN,NEWPT,IRJOUT	EXRM0170
	COMMON/INLETX/	EXRM0180
	AKR,KPTC(15),ALPHV(15),AAMACH(15,15),AOACC(15,15),PT3FTC(15,15),	EXRM0190
	IAADD(15,15)	EXRM0200
	COMMON /ALTDD/	EXRM0210
	IK1,ALT(24),SDTEMP(24),PRESS(24),ID(8)	EXRM0220
	COMMON /EXTRJ/ISKIP	EXRM0230
	COMMON/EXXPJ/ EX(48)	EXRM0240
	EQUIVALENCE	EXRM0250
	1(EX(1),PHI),(EX(2),THETA),(EX(3),TEXT),(EX(4),TTHRCT),	EXRM0260


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2(EX( 5),TENT ),(EX( 6),RHOEXT),(EX( 7),RHOHT),(EX( 8),RHOENT), EXRM0270
3(EX( 9), EXTER),(EX(10),RHOX ),(EX(11),TMINC ),(EX(12),TMIND ), EXRM0280
4(EX(13),EL ),(EX(14),FSULT ),(EX(15),FSYLD ),(EX(16),TINS ), EXRM0290
5(EX(17),RHOIN ),(EX(18),XSTAR ),(EX(19),CLEAR ),(EX(20),C1 ), EXRM0300
6(EX(21),C2 ),(EX(22),C3 ),(EX(23),C4 ),(EX(24),C5 ), EXRM0310
7(EX(25),C6 ),(EX(26),TINAFI),(EX(27),WRJ ),(EX(28),XRJ ), EXRM0320
8(EX(29),TE MPC ),(EX(30),MTLRAM),(EX(31),R3 ),(EX(32),RCR5 ), EXRM0330
8(EX(33),DS ),(EX(34),RHO ),(EX(35),TAH ),(EX(36),VDDMES), EXRM0340
8(EX(37),TCYL ),(EX(38),A3 ),(EX(39),SSAFS ) EXRM0350
COMMON /EXCWT/ WT(15) EXRM0360
DIMENSION Z(15),ZW(15),XII(15) EXRM0370
EQUIVALENCE (WT(1),FWDWTS),(WT(2),FWDWTI),(WT(3),BCSDMP), EXRM0380
1(WT(4),WCYS),(WT(5),WCYLI),(WT(6),EXTI),(WT(7),SKTS),(WT(9),AFTENG EXRM0390
2),(WT(11),ADWTS),(WT(12),ADWTI),(WT(13),WENT),(WT(14),WTHROT), EXRM0400
1(WT(15),WEXIT) EXRM0410
C C1 DUMP POSS MULTIPLIER EXRM0420
C C2 SKIRT WT MULTIPLIER EXRM0430
C C3 ATTACHMENT RING MULTIPLIER EXRM0440
C C4 MISC FWD WT EXRM0450
C C5 MISC CYL WT EXRM0460
C C6 MISC NOZ WT EXRM0470
DATA PI /3.14159/ EXRM0480
IF (ISKIP .EQ. 1) GO TO 10 EXRM0490
ISKIP = 1 EXRM0500
CALL TLU1(HP,ALT,K1,PRESS,PO,IND) EXRM0510
IF (IND.NE. 0 ) GO TO 38 EXRM0520
TO = 500. EXRM0530
CALL ISEN(TO,PO,AMACH,TT2,PTO) EXRM0540
IF(KFAIL .GT. 0 ) RETURN EXRM0550
CALL TLU2(ALF1,ALPHV,K8,AMACH,AAMACH,KPTC,PT3PTC,PTR,IND) EXRM0560
IF(IND.NE.0) GO TO 2014 EXRM0570
PCC = PTO*PTR/144. EXRM0580
NOUT = 1 EXRM0590
P3 = C3/2. EXRM0600
RCR5= 0.4 EXRM0610
A3 = D3**2/4.*PI EXRM0620
ADUMP = A3/6. EXRM0630
CS= D3 -2.*EXTER EXRM0640
CALL MATLS(MTLRAM,TE MPC,RHO,FTU,FTY,IND) EXRM0650
IF(IND.NE. 0 ) GO TO 35 EXRM0660
TCYLU =FSULT*PCC*DS/(FTU*2.) EXRM0670
TCYLY =FSYLD*PCC*DS/(FTY*2.) EXRM0680
TCYLT =AMAX1(TCYLU,TCYLY) EXRM0690
TCYL = AMAX1(TCYLT,TMINC) EXRM0700
TAHU =FSULT*PCC*FL*DS/FTU/4. EXRM0710
TAHY =FSYLD*PCC*FL*DS/FTY/4. EXRM0720
TAHT =AMAX1(TAHU,TAHY) EXRM0730
TAH =AMAX1(TAHT,TMIND) EXRM0740
IF(EL .LE. 1.)GO TO 11 EXRM0750
SEF = (1.-1./(EL*EI))**.5 EXRM0760
SSAFS = (PI*DS**2)/4.+((PI*DS**2)/(8.*EL**2*SEF))*ALCG((1.+SEF) EXRM0770
1/(1.-SEF)) EXRM0780
12 FWDWTS= SSAFS*TAH*RHO + C4 EXRM0790
FWDWTI= SSAFS*TINS*RHOIN EXRM0800
BCSDMP = ADUMP*RHO*TCYL *C1 EXRM0810

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VDMFS=PI*(DS-2.*(TINS+TAH))**3/(6.*EL)
10 R6 = SQRT(A6A3)*R3
R5 = SQRT(A5A3)*R3
RC = RCR5*R5
XA = RC *SIN(PHI)
XB = (R6-RC *(1.-COS(PHI))-R5)*COS(PHI)/SIN(PHI)
X1 = XA + XB
YZ= (1.-COS(THETA))*RC
YD=(R3-R5)*.8
IF(YD-YZ) 30,31,31
30 COTH=-YD/RC+1.
IF(COTH.GT.1 .OR.COTH.LE. 0.) GO TO 34
TANC=(SQRT(1.-COTH**2))/COTH
THET= ATAN(TANC)
THED=THET/.01745329
X3=RC*SIN(THET)
Y1 = R5 + YD
IF(NDUT.EQ.1) WRITE(6,6) THED
6 FORMAT(53H THE RAMJET NOZZLE ENTRANCE ARC HAS BEEN REVALUED TO ,
1F7.1, 8H DEGREES )
GO TO 32
11 SSAFS = PI * DS**2/2.
GO TO 12
21 X3=RC*SIN(THETA)
Y1 = R5 + RC*(1.-COS(THETA) )
THET = THETA
THED = THETA/.0174533
32 Z1 = SQRT((R3**2-Y1**2)/FL**2)
XRN = Z1+X3+X1
C EXIT SECTION
DELN = TAH + TEXIT
RHON = (RHO*TAH+RHOEXT*TEXTIT)/DELN
YN= DELN/2./COS(PHI)
YM1=R6+YN
YM2= R5+RC*(1.-COS(PHI))+YN
RPRN1=(YM1+YM2)/2.
ABRN1=XB/COS(PHI)*DELN
WEXIT = 2.*PI*RBRN1*ABRN1*RHON
C THROAT SECTION
XT=2.*XA
RHOT =(RHO* TAH +1.5*TTHROT*RHOHTI)/(TAH +1.5*TTHRCT)
DELM =TAH + TTHROT *1.5
ABRN2 = XT* DELM
RPRN2 = R5 + DELM/2.
WTHROT=2.* ABRN2*RHOT *PI*RBRN2 +C6
C ENTRANCE SECTION
TEAH =TAH + TENT
YM3 = YZ- TEAH/2.
XF=X3-XA
X4=SQRT(XF**2 +(YM3-YM2)**2)
ABRN3 = X4*TEAH
RPRN3 =(YM3+YM2)/2.
RENT=(RHO*TAH+RHOENT*TENT)/TEAH
WENT=2.*PI*RENT*ABRN3*RBRN3
WRN = WENT +WTHROT+ WEXIT

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EXRM0820
EXRM0830
EXRM0840
EXRM0850
EXRM0860
EXRM0870
EXRM0880
EXRM0890
EXRM0900
EXRM0910
EXRM0920
EXRM0930
EXRM0940
EXRM0950
EXRM0960
EXRM0970
EXRM0980
EXRM0990
EXRM1000
EXRM1010
EXRM1020
EXRM1030
EXRM1040
EXRM1050
EXRM1060
EXRM1070
EXRM1080
EXRM1090
EXRM1100
EXRM1110
EXRM1120
EXRM1130
EXRM1140
EXRM1150
EXRM1160
EXRM1170
EXRM1180
EXRM1190
EXRM1200
EXRM1210
EXRM1220
EXRM1230
EXRM1240
EXRM1250
EXRM1260
EXRM1270
EXRM1280
EXRM1290
EXRM1300
EXRM1310
EXRM1320
EXRM1330
EXRM1340
EXRM1350
EXRM1360

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EPSC = (Y1/R5)**2	EXRM1370
VREQ = A5A3*A3*XSTAR	EXRM1380
VCYL = VREQ - VDOMES	EXRM1390
XCYL = VCYL/(PI*(DS-2.*(TCYL+TINS))**2.)*4.	EXRM1400
DI=DS-2.*TINS	EXRM1410
WCYS = PI*DS*XCYL*TCYL*RHC + C5	EXRM1420
WCYL1=PI*DI*XCYL*TINS*RHCIN	EXRM1430
AAFT = (SSAFS/2.-EPSC*A5A3*A3)	EXRM1440
ADWTS= AAFT*TAH*RHO	EXRM1450
ADWTI= AAFT*TINAFT*RHOIN	EXRM1460
ATTACH = 4.*PI*DS*TMINC*RHO *C3	EXRM1470
XSKT = DS/EL/2.	EXRM1480
XSK1= XSKT+ CLEAR	EXRM1490
SKTS =PI*DS*XSK1*TMINC*RHO*C2	EXRM1500
AFTENG =PI*DS*XRN*TMINC*RHO	EXRM1510
XPJ = XCYL+XSKT +CLEAR + XRN	EXRM1520
EXTI =PI*DS*XRJ *EXTER*RHOX	EXRM1530
WT(8) = ATTACH/2.	EXRM1540
WT(10) = WT(8)	EXRM1550
WPJ= 0.0	EXRM1560
DO 105 I=1,15	EXRM1570
105 WPJ= WPJ+ WT(I)	EXRM1580
IF(II(11).EQ. 0) GO TO 110	EXRM1590
C ITEM 1 FWD DOME	EXRM1600
RS= DS/2.	EXRM1610
RI= RS-TINS	EXRM1620
IF(EL .LE.1.) GO TO 100	EXRM1630
CALL ZELPLL(EL,RHO,RS,0.0,TAH,0.0,1,XII(1),Z(1),ZW(1))	EXRM1640
C ITEM 2 FWD INSULATION	EXRM1650
F=PS/FL-TINS	EXRM1660
FF= RI/F	EXRM1670
CALL ZELPLL(EE,RHOIN,RI,C.0,TINS,TAH,1,XII(2),Z(2),ZW(2))	EXRM1680
C ITEM 3 DUMP STIFFENERS	EXRM1690
101 CALL ZCYLLL(RS,BOSDMP,RS,XSKT,XII(3),Z(3),ZW(3))	EXRM1700
C ITEM 4 SIDEWALL CASE	EXRM1710
CALL ZCYLLL(XCYL,WCYS,RS,XSKT,XII(4),Z(4),ZW(4))	EXRM1720
C ITEM 5 SIDEWALL INSULATION	EXRM1730
CALL ZCYLLL(XCYL,WCYL1,RI,XSKT,XII(5),Z(5),ZW(5))	EXRM1740
C ITEM 6 EXTERNAL INSULATION	EXRM1750
XRJ = XCYL+ XSK1+ XRN	EXRM1760
CALL ZCYLLL(XRJ,EXTI,R3,0.0,XII(6),Z(6),ZW(6))	EXRM1770
C ITEM 7 SKIRT WT FWD	EXRM1780
CALL ZCYLLL(XSK1,SKTS, RS,0.0,XII(7),Z(7),ZW(7))	EXRM1790
C ITEM 8 ATTACH WT FWD	EXRM1800
CALL ZCYLLL(2.,WT(8),RS,C.0,XII(8),Z(8),ZW(8))	EXRM1810
C ITEM 9 AFT FAIRING	EXRM1820
FLX= XSK1 + XCYL	EXRM1830
CALL ZCYLLL(XRN,AFTENG,RS,FLX,XII(9),Z(9),ZW(9))	EXRM1840
C ITEM 10 AFT ATTACH WT	EXRM1850
FLX2= FLX + Z1	EXRM1860
CALL ZCYLLL(2.,WT(10),RS,FLX2,XII(10),Z(10),ZW(10))	EXRM1870
C ITEM 11 AFT DOME	EXRM1880
CALL ZELPLL(EL,RHO,RS,EPSC,TAH,FLX,0,XII(11),Z(11),ZW(11))	EXRM1890
C ITEM 12 AFT INSULATION	EXRM1900
CALL ZELPLL(EE,RHOIN,RI,EPSC,TINAFT,FLX,0,XII(12),Z(12),ZW(12))	EXRM1910

C	ITEM 13 ENTRANCE SECTION	FXRM1920
	CALL ZCONHH(XE,WENT,YM3,YM2,FLX,0,XII(13),Z(13),ZW(13))	FXRM1930
C	ITEM 14 THROAT SECTION	FXRM1940
	FL3=FLX+XE	FXRM1950
	CALL ZCYLLL(XT,WTHROT,YM2,FL3,XII(14),Z(14),ZW(14))	FXRM1960
C	ITEM 15 EXIT SECTION	FXRM1970
	FL3=FL3+XT	FXRM1980
	CALL ZCONHH(XA,WEXIT,YM1,YM2,FL3,1,XII(15),Z(15),ZW(15))	FXRM1990
	ZWT= 0.0	FXRM2000
	DO 106 I=1,15	FXRM2010
106	ZWT= ZWT + ZW(I)	FXRM2020
	ZEXPAM = ZWT/WRJ	FXRM2030
	XITOT =0.0	FXRM2040
	XMOV =0.0	FXRM2050
	DO 107 I=1,15	FXRM2060
	XITOT = XITOT +XII(I)	FXRM2070
107	XMOV= XMOV +(ZEXRAM-Z(I))*2*WT(I)	FXRM2080
	XIIEXR = XMOV + XITOT	FXRM2090
110	CONTINUE	FXRM2100
	WCOMM=PCSDMP+SKTS+FWDWTS+WCYC+ADWTS	FXRM2110
	VCOMI= (FWDWTI+WCYLI+ADWTI) / RHOIN + EXTI/RHOX	FXRM2120
	WNOZ=WRN	FXRM2130
	IF(I(15) .EQ. 0) RETURN	FXRM2140
	WRITE(6,99)	FXRM2150
99	FORMAT(1H1)	FXRM2160
	WRITE(6,120) WRJ,WT	FXRM2170
120	FORMAT(10X,38H *** NON INTEGRAL RAMJET COMBUSTOR ***//13H WEIGHTS,	FXRM2180
	1 LBS /	FXRM2190
	12X,13HTOTAL RAMJET ,F9.3,9X,13HFWO CLOSURE ,F9.3,9X,13HFWO INSULT	FXRM2200
	1N ,F9.4/	FXRM2210
	22X,13HDUMP STIFFNR ,F9.3,9X,13HCYL STRUCTUR ,F9.3,9X,13HCYL INSULT	FXRM2220
	2N ,F9.4/	FXRM2230
	32X,13HEXT INSULTN ,F9.3,9X,13HFWO SKIRT ,F9.3,9X,13HFWO ATCHMN	FXRM2240
	3T ,F9.4/	FXRM2250
	42X,13HAFT SKT/FRNC ,F9.3,9X,13HAFT ATCHMNT ,F9.3,9X,13HAFT CLOSURE	FXRM2260
	4E ,F9.4/	FXRM2270
	52X,13HAFT INSULTN ,F9.3,9X,13HNCZ ENTRANCE ,F9.3,9X,13HNOZ THRCAT	FXRM2280
	5 ,F9.4/	FXRM2290
	62X,13HNOZ EXIT CONE,F9.3//)	FXRM2300
	WRITE(6,121) IR	FXRM2310
121	FORMAT(30H STRUCTURAL AND CASE MATERIAL,2X,3A4/)	FXRM2320
	IF (I(11) .GT. 0)	FXRM2330
	1WRITE(6,123) ZEXRAM,XIIEXR	FXRM2340
123	FORMAT(/2X, 5H C.C. ,F9.3,9X,5HMOI ,F9.1)	FXRM2350
	WRITE(6,122) XRJ,XRN,VREQ,XCYL,XSKI,TCYL,TAH,TINS,EXTER,	FXRM2360
	1 XE,TEAH,YM3,XT,YM2,XB,DELN,YM1	FXRM2370
122	FORMAT(2X,15HDIMENSIONS, INS /	FXRM2380
	12X,13HTOTAL LENGTH ,F9.3,9X,13HNOZ LENGTH ,F9.3,9X,13HVOLUME CU	FXRM2390
	1IN ,F9.1/	FXRM2400
	22X,13HCYL LENGTH ,F9.3,9X,13HFWO SKT LT ,F9.3,9X,13HCYL THICKN	FXRM2410
	2ESS,F9.4/	FXRM2420
	32X,13HCLOSURE TKNS ,F9.4,9X,13HINSLN THKNS ,F9.4,9X,13HEXT INS TH	FXRM2430
	3KNS,F9.4/	FXRM2440
	42X,13HENTRANCE LT ,F9.3,9X,13HENTRANCE TK ,F9.4,9X,13HENTRANCE R	FXRM2450
	4AD ,F9.3/	FXRM2460

52X,13HTRDPT LT ,F9.3,40X,13HTHROAT EX RAD,F9.3/	EXRM2470
62X,13HEXIT CONE LT ,F9.3,9X,13HEXIT CONE TK ,F9.4,9X,13HEXIT CONE	EXRM2480
6RAD,F9.3)	EXRM2490
RETURN	EXRM2500
100 CALL 7SPRL(RHO,RS,TAH,C.C,0.0,1,XII(1),Z(1),ZW(1))	EXRM2510
CALL 7SPRL(RHOIN,RI,TINS,C.C,TAH,1,XII(2),Z(2),ZW(2))	EXRM2520
GO TO 101	EXRM2530
2014 WRITE(6,2015) AMACH, ALPHV	EXRM2540
2015 FORMAT(/10X,34HFAILURE TRYING TO READ INLET MAP /	EXRM2550
110X, 7HAMACH = ,F10.5, 8H ALF1 = ,F10.5)	EXRM2560
WRITE (6,545) BOMB,IARI(MUM)	EXRM2570
545 FORMAT (' 1ST IND VARIABLE= ',E12.5,' 2ND IND VARIABLE= ',E12.5,' S	EXRM2580
1UPTABLE = ',F10.3,' SUBTABLE SIZE = ',F10.3/' THE VARIABLE OUT OF PA	EXRM2590
2NGE IS THE ',A4,' INDEPENDENT VARIABLE' /)	EXRM2600
RETURN	EXRM2610
28 WRITE (6,35) HP	EXRM2620
39 FORMAT(2X,42HERROR TRYING TO OBTAIN ATTITUDE DATA,ALT = ,F8.1)	EXRM2630
RETURN	EXRM2640
34 WRITE(6,3)	EXRM2650
3 FORMAT(' FAILURE IN EXRAM WHEN TRYING TO REVALUE ENTRANCE ARC')	EXRM2660
IND= 1	EXRM2670
RETURN	EXRM2680
35 WRITE (6,36) MTLRAM	EXRM2690
36 FORMAT(26H ERROR IN SUBROUTINE MATLS ,I5)	EXRM2700
RETURN	EXRM2710
END	EXRM2720

SUBROUTINE INLETP	INLT0010
C NUK.CM-CGSM R.K.MCDONOUGH FIV/ERCD 10/18/73	INLT0020
COMPUTER PROGRAM TO CALCULATE INLET WEIGHT AND DRAG (STAND-ALONE CHECK	INLT0030
COMMON /INLSTP/ AWETO	INLT0040
COMMON/TJINLP/XENG,RENG,XMISSL	INLT0050
COMMON /PJDAT/ CFNR0,CFN, A5A3,A6A3,ACA3,SFC,BOSTWT,BOSTXX,	INLT0060
1 BOSTPP	INLT0070
COMMON /INCOMM/XLDUMP,XFERNG,XINLET,XTIPCL,STERM,TNOZL	INLT0080
COMMON /MATTP/ IR(3)	INLT0090
DIMENSION ICC1(3)	INLT0100
COMMON /IPROP/ IND,IMIN,NEWPT,IRJOUT	INLT0110
COMMON /ALTD/	INLT0120
IK1,ALT(24),SDTEMP(24),PRESS(24),ID(8)	INLT0130
COMMON /INDATA/ CDINL, CLALF,WEIGHT	INLT0140
DATA PI,C / 3.14159, 0.01745329 /	INLT0150
COMMON /INDEX/ X1,X2,X3,X4,XC,Y1,Y2,Y3,Y4,YC,XT,AMT,DEL1,DEL2,DEL3	INLT0160
1,XMDES	INLT0170
COMMON/INDATX/ HPROJ,HC,W,HBLER,ANGLEL,ANGLEU,ANGDUB,ARLDIV,	INLT0180
1HPLDIV,XCHECK,XFERNG,XNAC ,XDIST ,AWET,AWETFF,DELEXT,ADIVWT,	INLT0190
2XLBYD,AFEPJ,ACPPJ, TSTART,TERNG, HP	INLT0200
COMMON/CODEXX/ ININ(16)	INLT0210
EQUIVALENCE (ININ(2),ITYPE),(ININ(8),NDOCT),(ININ(9),AFRNG)	INLT0220
EQUIVALENCE (ININ(15),NOUT)	INLT0230
COMMON/EXTEPN/ ARR(20)	INLT0240
EQUIVALENCE (ARR(1),PLLT),(ARR(3),D3), (ARR(14),TANLT)	INLT0250
1,(ARR(15),AR),(ARR(16),XMZERO),(ARR(17),XMPJTO),(ARR(18),HEIGHT),	INLT0260

1(ARR(19),BOSTLT)	INLT0270
COMMON / SUSDAT/ TX(44)	INLT0280
EQUIVALENCE (TX(23),SUSLT)	INLT0290
EQUIVALENCE (ININ(1),KIND)	INLT0300
DIMENSION X(50),Y(50),Z(50),AREA(50),WGHT(50),RIX(50)	INLT0310
NAMLIST /JONSON/ HBLDIV,AWETAF,AWETFF,ADIVWT,AWET	INLT0320
ARATIO(X)=125./(216.*X)*(1.+2*X*X)**3.	INLT0330
NAMLIST /QQ/ PLLT,SUSLT,D3,XDUMP, XLCB,HTH,X4,XC,XTIPCL	INLT0340
T=TSTART	INLT0350
IND=0	INLT0360
HP = HEIGHT	INLT0370
CALL TLUI(HP,ALT,K1,PRESS,PO,IND)	INLT0380
IF(IND.NE.0) GO TO 38	INLT0390
CALL TLUI(SDTEMP,TD)	INLT0400
TTEMP=TD*(1.+2*XMZERO*XMZERO)-460.	INLT0410
CALL MATLS(INDUCT,TTEMP,RHQA,FTU,FTY,IND)	INLT0420
IF(IND.NE.0) GO TO 1492	INLT0430
DO 5 I=1,3	INLT0440
5 ICCL(I)= IR(I)	INLT0450
CALL MATLS(NFRNG,TTEMP,RHFRG,FTU,FTY,IND)	INLT0460
IF(IND.NE.0) GO TO 1492	INLT0470
CONTR=1./XT	INLT0480
C MATERIALS ARE DESIGNATED AS FOLLOWS	INLT0490
C A AISI 150 PSI STEEL CODE 1	INLT0500
C B AISI 200 PSI STEEL CODE 2	INLT0510
C C 300 GR MARACING STEEL CODE 3	INLT0520
C D 17-4 PH STAINLESS CODE 4	INLT0530
C E 2014-T6 ALUMINUM CODE 5	INLT0540
C G AZ31B-0 MAGNESIUM CODE 6	INLT0550
C H 6AL-4V TITANIUM CODE 7	INLT0560
C P RENE 41 CODE 8	INLT0570
C Q WC129Y COLUMBIUM CODE 9	INLT0580
C R GLASS FABRIC EPOXY LAMINATE CODE 10	INLT0590
C S FILAMENT WOUND GLASS EPOXY CODE 11	INLT0600
A3 = ARR(12) *144.	INLT0610
AC=ACA3*A3	INLT0620
IF(KIND.NE.41.AND.KIND.NE.43.AND.KIND.NE.53) XMRJTC=0.01	INLT0630
C ITYPE=1 IS A SINGLE BELLY-LINE. ITYPE =2 IS DUAL AFT.	INLT0640
C BRANCH DEPENDING ON ITYPE.	INLT0650
XNINLT = ITYPE	INLT0660
ACPER=AC/XNINLT	INLT0670
CALCULATE COWL LIP ANGLES AT THE INLET DESIGN MACH NUMBER	INLT0680
SINMAX=(3.*AMT*AMT-5 +SQRT(9.*AMT**4 +12.*AMT**2 +60.))/	INLT0690
1(7.*AMT**2)	INLT0700
WAVMAX=AR SIN(SQRT(SINMAX))	INLT0710
AA=6.*AMT**2	INLT0720
BB=5.*(AMT**2 *SINMAX-1.)	INLT0730
COTAN=TAN(WAVMAX)*(AA/BB-1.)	INLT0740
TANDEL=1./COTAN	INLT0750
DELCLR=ATAN(TANDEL)	INLT0760
DELCLD=DELCLR/C -1.	INLT0770
DELEND=DEL1+DEL2+DEL3	INLT0780
DELINT=DELEND-DELCLD	INLT0790
CELEXT=DELINT+7.	INLT0800
CALCULATE THE RATIO OF DUMP AREA TO THROAT AREA	INLT0810


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      AMTY=SQRT((AMT**2 +5.)/(7.*AMT**2 -1.))
      ARTHRT=ARATIO(AMTY)
C      R/J ONLY
      GO TO 5001
5009 CONTINUE
      ATHRT=XT*AC
      RTHRT=SQRT(ATHRT/PI)
      XLDIFF=(RENGO-RTHRT)/(TAN(3.5*C))
5001 CONTINUE
      APDUMP=ARATIO(0.3)
      AQUATH=APDUMP/ARTHRT
      IF (NOUT.EQ.0) GO TO 300
C      WRITE INLET DATA
      WRITE(6,3000)
3000 FORMAT ( 5X,61H SUMMARY DATA FOR INLET WEIGHT,DRAG,C.G.AND MOMENT
      IT OF INERTIA,/)
      WRITE(6,6) ICC1,IB
      6 FORMAT(10X,14H DUCT MATERIAL ,3A4,18H FAIRING MATERIAL ,3A4)
      IF(ITYPE.EQ.1)WRITE(6,3001)
3001 FORMAT(10X,23H SINGLE BELLY-LINE INLET,/)
      IF(ITYPE.EQ.1)GO TO 1747
      WRITE(6,3002)
3002 FORMAT(10X,15H DUAL AFT INLETS,/)
1747 WRITE (6,3003) ACA3,AC,D3,DEL1,DEL2,DEL3,CONTR,DELINT,DEEXT,
      1XMD5,XMZFRO,AMT,DELCLD ,XMRJTO
3003 FORMAT(10X,19H CAPTURE AREA RATIO=,F5.3,/,10X,19H INLET CAPTURE AREA
      1=,F6.2,1X,25H SQ.IN.(TOTAL FOR MISSILE),/,10X,
      21H MISSILE DIAMETER=,F5.2,2X,3H IN.,/,10X,27H COMPRESSION RAMP ANGLE
      3S ARE,F5.2,1H,,F5.2,1H,,F5.2,1X,13H DEG(RELATIVE),/,
      410X,29H INLET OVERALL CONTRACTION IS ,F5.2,/,10X,
      53H COWL INITIAL INTERNAL ANGLE IS ,F5.2,4H DEG,/,10X,
      63H COWL INITIAL EXTERNAL ANGLE IS ,F5.2,4H DEG,/,10X,
      72H INLET DESIGN MACH NUMBER IS ,F4.2,/,10X,29H FLIGHT MACH N
      8UMBER IS ,F4.2,/,10X,28H INLET THROAT MACH NUMBER IS ,F6.3,/,10X,
      95H MAXIMUM DEFLECTION ANGLE AT THROAT MACH NUMBER IS ,F5.2,1X,
      A4H DEG.,/,10X,31H RAMJET TAKEOVER MACH NUMBER IS ,F4.2,/)
      CALCULATE INLET WIDTH,HEIGHT,ETC. FOR 6 ASPECT RATIOS. ASPECT RATIO IS
      C WIDTH (CONSTANT) DIVIDED BY HEIGHT(COMPRESSION DIRECTION).
      CALCULATE THE AREAS OF THE INLET SURFACES FIRST,ON THE SIDEPLATE
      300 HC=SQRT(ACPER/AR)
      W=ACPER/HC
      X1=X1*HC
      X2=X2*HC
      X3=X3*HC
      X4=X4*HC
      XC=XC*HC
      XT=XT*HC
      Y1=Y1*HC
      Y2=Y2*HC
      Y3=Y3*HC
      Y4=Y4*HC
      YC=YC*HC
C      TURNBACK COWL AT 10 DEG PER THROAT HEIGHT
      XLTURN=DELINT/10.
      XLTURN=XLTURN*XT

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XTIPCL=XC	INLT1370
C USE A THROAT LENGTH OF 2 THROAT HEIGHTS	INLT1380
HTH=XT	INLT1390
CALCULATE APPROX. THE INCREASE IN EXT. LIP HT. TO TURNBACK COWL.	INLT1400
HPROJ=XLTURN*TAN((DELINT/2.)*C)	INLT1410
ACPROJ=HPROJ*W	INLT1420
C THE INCREASE IN CENTERBODY HEIGHT IS EQUAL TO HPROJ. ADD A 1 DEG THROAT	INLT1430
XDIFF=Y4 +HPROJ-2.*HTH*TAN(1.*C)	INLT1440
C REDUCE THE CENTERBODY HEIGHT TO ZERO AT 7. DEG	INLT1450
XLCB=XDIFF/(TAN(7.*C))	INLT1460
IF(KIND.GT.49.AND.KIND.LT.60) XLCB=XDIFF	INLT1470
CALCULATE THE LENGTH OF THE DUMP AREA	INLT1480
ATHRT=XT*W	INLT1490
ADUMP=ADUATH*ATHRT	INLT1500
XLDUMP=ADUMP/(HC+HPROJ)	INLT1510
IF(KIND.GT.49.AND.KIND.LT.60) XLDUMP=0.	INLT1520
XINLET=XLCB+2.*HTH+X4-XC+XTIPCL+XLTURN	INLT1530
CHECK THAT INLET LEADING EDGE IS AFT OF TANGENCY POINT	INLT1540
XTOTAL=PLLT+ROSTLT+SUSLT	INLT1550
C R/J ONLY	INLT1560
GO TO 502	INLT1570
5008 CONTINUE	INLT1580
IF(KIND.GT.49.AND.KIND.LT.60) XTOTAL=XMISSL	INLT1590
XLENG=XENG+2.*RENGO	INLT1600
XPRTJ=XLENG+XINLET	INLT1610
XTJCHK=XTOTAL-XPRTJ	INLT1620
IF(KIND.GT.49.AND.KIND.LT.60) XCHECK=XTJCHK	INLT1630
5002 CONTINUE	INLT1640
XDUMP=PLLT+SUSLT+D3/4.	INLT1650
XCHECK=XDUMP-XINLET	INLT1660
IF(XCHECK.LE.TANLT)GO TO 111	INLT1670
C INLET LEADING EDGE OK NOW ADD AFT FAIRING	INLT1680
GO TO 200	INLT1690
111 IF (NOUT .NE. 0) WRITE (6, 10)	INLT1700
IF (NOUT .GT. 0) WRITE (6, 00)	INLT1710
IND = 1	INLT1720
GO TO 113	INLT1730
10 FORMAT(5X,50HINLET STARTS FORWARD OF TANGENCY POINT ERRORRED OUT)	INLT1740
200 XFRNG=XTOTAL-XDUMP	INLT1750
IF(KIND.GT.49.AND.KIND.LT.60) XFRNG=XLENG	INLT1760
C XFRNG IS DISTANCE FROM END OF DUMP PORT TO END OF MISSILE	INLT1770
CALCULATE THE BOUNDARY LAYER (AND DIVERTER) THICKNESSES	INLT1780
RHOAIR=PO/(53.3*TO)	INLT1790
RHOSLG=RHOAIR/32.2	INLT1800
XMU=(0.302/1000000)*((392.+198.)/(TO+198.))*(TO/392.)*1.5	INLT1810
VSOUND=49.02*SQR(TO)	INLT1820
REYFTM=VSOUND*RHOSLG/XMU	INLT1830
REYFT=REYFTM*XMZERO	INLT1840
REY=REYFT*(XCHECK/12.)	INLT1850
FRLYER=0.378*XCHECK/(REY**0.2)	INLT1860
REYDES=7101000.*XMDER*XCHECK/12.	INLT1870
IF(HP.GT.0.) REYDES=REYFTM*XMDER*XCHECK/12.	INLT1880
FRLDIV=.75*.378*XCHECK/(REYDES**0.2)	INLT1890
CALCULATE THE MASS PROPERTIES.FIRST,LOCATE THE PIECES.FIRST,CUTBD SDPLT.	INLT1900
AREA(1)=XTIPCL*HC/2.	INLT1910

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X(1)=W+1.5*T
IF(I TYPE.EQ.1) X(1)=(W+T)/2.
Y(1)=-(T+HC/3.)
Z(1)=2.*XTIPCL/3.
APFA(2)=XLTURN*HC
X(2)=X(1)
Y(2)=-(T+HC/2.)
Z(2)=XTIPCL+XLTURN/2.
APFA(3)=(HPROJ+T)*(XLTURN/2.)
X(3)=X(1)
Y(3)=-(T+HC+(HPROJ+T)/3.)
Z(3)=2.*XLTURN/3.+XTIPCL
APFA(4)=(HC+HPROJ+T)*((X4-XC)+2.*XT)
X(4)=X(1)
Y(4)=-(T+(HC+HPROJ+T)/2.)
Z(4)=XTIPCL+XLTURN+((X4-XC)+2.*XT)/2.
AREA(5)=(HC+HPROJ+T)*(XLCB+XLDUMP)
X(5)=X(1)
Y(5)=Y(4)
Z(5)=XTIPCL+XLTURN+X4-XC+2.*XT+0.5*(XLCB+XLDUMP)
CALCULATE THE INBOARD SIDEPLATE
AREA(7)=AREA(1)
X(7)=T/2.
IF(I TYPE.EQ.1) X(7)=-X(1)
Y(7)=Y(1)
Z(7)=Z(1)
AREA(8)=AREA(2)
X(8)=X(7)
Y(8)=Y(2)
Z(8)=Z(2)
AREA(9)=AREA(3)
X(9)=X(7)
Y(9)=Y(3)
Z(9)=Z(3)
AREA(10)=AREA(4)
X(10)=X(7)
Y(10)=Y(4)
Z(10)=Z(4)
AREA(11)=AREA(5)
X(11)=X(7)
Y(11)=Y(5)
Z(11)=Z(5)
CALCULATE THE BOTTOM SURFACE AREA (COWL SIDE)
AREA(13)=W*SQRT(XLTURN**2+(HPROJ+T)**2)
X(13)=T+W/2.
IF(I TYPE.EQ.1) X(13)=0.
Y(13)=-(T+HC+(HPROJ+T)/2.)
Z(13)=XTIPCL+XLTURN/2.
APFA(14)=(X4-XC+2.*XT+XLCB+XLDUMP)*W
X(14)=X(13)
Y(14)=-(T+HC+HPROJ+T/2.)
Z(14)=XTIPCL+XLTURN+0.5*(X4-XC+2.*XT+XLCB+XLDUMP)
CALCULATE THE TOP INLET SURFACE
AREA(16)=(XTIPCL+XLTURN+X4-XC+2.*XT+XLCB+XLDUMP)*W
X(16)=T+W/2.

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INLT1920
INLT1930
INLT1940
INLT1950
INLT1960
INLT1970
INLT1980
INLT1990
INLT2000
INLT2010
INLT2020
INLT2030
INLT2040
INLT2050
INLT2060
INLT2070
INLT2080
INLT2090
INLT2100
INLT2110
INLT2120
INLT2130
INLT2140
INLT2150
INLT2160
INLT2170
INLT2180
INLT2190
INLT2200
INLT2210
INLT2220
INLT2230
INLT2240
INLT2250
INLT2260
INLT2270
INLT2280
INLT2290
INLT2300
INLT2310
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INLT2330
INLT2340
INLT2350
INLT2360
INLT2370
INLT2380
INLT2390
INLT2400
INLT2410
INLT2420
INLT2430
INLT2440
INLT2450
INLT2460

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IF(ITYPE.EQ.1) X(16)=C.	INLT2470
Y(16)=-T/2.	INLT2480
Z(16)=AREA(16)/(2.*W)	INLT2490
C THAT COMPLETES THE EXTERNAL. NOW DO THE INTERNAL. DO SPLITTER FIRST.	INLT2500
AREA(18)=X2*Y2/2.	INLT2510
X(18)=T+W/2.	INLT2520
IF(ITYPE.EQ.1) X(18)=C.	INLT2530
Y(18)=- (T+Y2/3.)	INLT2540
Z(18)=2.*X2/3.	INLT2550
AREA(19)=Y2*(X3-X2)	INLT2560
X(19)=X(18)	INLT2570
Y(19)=- (T+Y2/2.)	INLT2580
Z(19)=X2+(X3-X2)/2.	INLT2590
AREA(20)=(X3-X2)*(Y3-Y2)/2.	INLT2600
X(20)=X(18)	INLT2610
Y(20)=- (T+Y2+(Y3-Y2)/3.)	INLT2620
Z(20)=X2+0.667*(X3-X2)	INLT2630
AREA(21)=Y3*(X4-X3)	INLT2640
X(21)=X(18)	INLT2650
Y(21)=- (T+Y3/2.)	INLT2660
Z(21)=X3+(X4-X3)/2.	INLT2670
AREA(22)=(Y4-Y3)*(X4-X3)/2.	INLT2680
X(22)=X(18)	INLT2690
Y(22)=- (T+Y3+(Y4-Y3)/3.)	INLT2700
Z(22)=X3+(X4-X3)*2./3.	INLT2710
C NOW THE SPLITTER EXTENDS FROM THE COWL CLEAR ACROSS THE INLET	INLT2720
AREA(23)=(X4-XC)*(YC-Y4)/2.	INLT2730
X(23)=X(18)	INLT2740
Y(23)=- (T+Y4+2.*(YC-Y4)/3.)	INLT2750
Z(23)=XC+2.*(X4-XC)/3.	INLT2760
AREA(24)=XLTURN*HPRDJ/2.	INLT2770
X(24)=X(18)	INLT2780
Y(24)=- (T+HC+HPRDJ/3.)	INLT2790
Z(24)=XC+2.*XLTURN/3.	INLT2800
AREA(25)=HC*(XLTURN-(X4-XC))	INLT2810
X(25)=X(18)	INLT2820
Y(25)=- (T+HC/2.)	INLT2830
Z(25)=X4+0.5*(XLTURN-(X4-XC))	INLT2840
AREA(26)=(HC+HPRDJ)*((X4-XC)+2.*XT+XLCB)	INLT2850
X(26)=X(18)	INLT2860
Y(26)=- (T+(HC+HPRDJ)/2.)	INLT2870
Z(26)=XTIPCL+XLTURN+0.5*(X4-XC+2.*XT+XLCB)	INLT2880
C NEXT TO THE FLOOR (COMPRESSION SURFACE)	INLT2890
AREA(27)=W*SQRT(X2*X2+Y2*Y2)	INLT2900
X(27)=X(18)	INLT2910
Y(27)=- (T+Y2/2.)	INLT2920
Z(27)=X2/2.	INLT2930
AREA(28)=W*SQRT((X3-X2)**2 +(Y3-Y2)**2)	INLT2940
X(28)=X(18)	INLT2950
Y(28)=- (T+Y2+(Y3-Y2)/2.)	INLT2960
Z(28)=X2+(X3-X2)/2.	INLT2970
AREA(29)=W*SQRT((X4-X3)**2 +(Y4-Y3)**2)	INLT2980
X(29)=X(18)	INLT2990
Y(29)=- (T+Y3+(Y4-Y3)/2.)	INLT3000
Z(29)=X3+(X4-X3)/2.	INLT3010

AREA(30)=W*SQR(T(XLTURN**2+HPRCJ**2))	INLT3020
X(30)=X(18)	INLT3030
Y(30)=-(T+Y4+HPRCJ/2.)	INLT3040
Z(30)=X4+XLTURN/2.	INLT3050
AREA(31)=W*2.*XT	INLT3060
X(31)=X(18)	INLT3070
Y(31)=-(T+(Y4+HPRCJ+HDIFF)/2.)	INLT3080
Z(31)=X4+XLTURN+XT	INLT3090
AREA(32)=W*SQR(T(HDIFF**2+XLCB**2))	INLT3100
X(32)=X(18)	INLT3110
Y(32)=-(T+HDIFF/2.)	INLT3120
Z(32)=X4+XLTURN+2.*XT+XLCB/2.	INLT3130
C THE NEXT PIECE IS THE TURN SECTION	INLT3140
IF(ITYPE.EQ.1) GO TO 76	INLT3150
AREA(33)=(HC+HPRCJ)*SQR(T(XLDUMP**2+(W+T+HBLDIV)**2))	INLT3160
X(33)=(T+W+HBLDIV)/2.-HBLDIV	INLT3170
Y(33)=-(T+(HC+HPRCJ)/2.)	INLT3180
Z(33)=X4+XLTURN+2.*XT+XLCB+XLDUMP/2.	INLT3190
CALCULATE THE BOUNDARY LAYER DIVERTER PROJECTED AND WETTED AREAS. INCLUDING	INLT3200
C THE EFFECT OF MISSILE BODY DIAMETER(VARYING DISTANCE TO EDGE OF INLET	INLT3210
CALCULATE PROJECTED AREA	INLT3220
SINU=(HC/2.+T)/(D3/2.)	INLT3230
ANGLEU=AR SIN(SINU)	INLT3240
SINL=(HC/2.+T+HPRCJ)/(D3/2.)	INLT3250
ANGLEL=AR SIN(SINL)	INLT3260
AREA1U=(HC/2.+T)*HBLDIV	INLT3270
AREA2U=(D3/2.)*(1.-COS(ANGLEU))*(HC/2.+T)/2.	INLT3280
ASEGU=0.5*((D3/2.)**2)*(ANGLEU-SINU)	INLT3290
AURLDV=AREA1U+AREA2U-ASEGU	INLT3300
AREA1L=(HC/2.+HPRCJ+T)*HBLDIV	INLT3310
AREA2L=(D3/2.)*(1.-COS(ANGLEL))*(HC/2.+HPRCJ+T)/2.	INLT3320
ASEGL=0.5*((D3/2.)**2)*(ANGLEL-SINL)	INLT3330
ALBLDV=AREA1L+AREA2L-ASEGL	INLT3340
APLDIV=AURLDV+ALBLDV	INLT3350
CALCULATE WETTED AREAS UPPER HALF, THEN LOWER HALF	INLT3360
AREA(6)=HBLDIV*(HC/2.+T)/SIN(10.*C)	INLT3370
X(6)=-HBLDIV/2.	INLT3380
Y(6)=-(T+HC/4.)	INLT3390
Z(6)=XC/2.+0.5*(HC/2.+T)/TAN(10.*C)	INLT3400
AREA(12)=((HC/2.+T)/SIN(10.*C))*(D3/2.-SQR(T((D3/2.)**2-(HC/2.+T)**2))	INLT3410
12))	INLT3420
AREA(12)= AREA(12)/2.	INLT3430
X(12)=-HBLDIV-1.*((D3/2.-SQR(T((D3/2.)**2-(HC/2.+T)**2)))/3.	INLT3440
Y(12)= -(HC/2.+T)/3.	INLT3450
Z(12)=XC/2.+2.*((HC/2.+T)/TAN(10.*C))/3.	INLT3460
AREA(15)=HBLDIV*((HC/2.+T+HPRCJ)/SIN(10.*C))	INLT3470
X(15)= X(6)	INLT3480
Y(15)=-(T+HC/2.+(HC/2.+T+HPRCJ)/2.)	INLT3490
Z(15)=XC/2.+C.5*((HC/2.+HPRCJ+T)/TAN(10.*C))	INLT3500
AREA(17)=((HC/2.+HPRCJ+T)/SIN(10.*C))*(D3/2.-SQR(T((D3/2.)**2	INLT3510
1-(HC/2.+HPRCJ+T)**2))	INLT3520
AREA(17)=AREA(17)/2.	INLT3530
X(17)=-HBLDIV-1.*((D3/2.-SQR(T((D3/2.)**2-(HC/2.+T+HPRCJ)**2)))/3.)	INLT3540
Y(17)=-(T+HC/2.+2.*((HC/2.+HPRCJ+T)/3.)	INLT3550
Z(17)=XC/2.+2.*((HC/2.+HPRCJ+T)/TAN(10.*C))/3.	INLT3560

GO TO 1692	INLT3570
C LOOP TO CORRECT BACK IF WIDTH EXCEEDS MISSILE DIAMETER	INLT3580
41 SINE = 1.0	INLT3590
HAL = 0.	INLT3600
GO TO 42	INLT3610
CALCULATE FOR SINGLE BELLY-LINE	INLT3620
76 AREA(33)=W*SQRT(XLDUMP**2+(HC+HPRDJ+T)**2)	INLT3630
X(33)=X(18)	INLT3640
Y(33)=-(T+HC+HPRDJ-HBLDIV)/2.	INLT3650
Z(33)=XTIPCL+XLTURN+X4-XC+2.*XT+XLCB+XLDUMP/2.	INLT3660
CALCULATE DIVERTER PROJECTED AREA	INLT3670
IF((W/2.+T).GT.D3/2.) GO TO 41	INLT3680
HAL = SQRT((D3/2.)**2 - (W/2. + T)**2)	INLT3690
SINE=(W/2.+T)/(D3/2.)	INLT3700
42 ANG=ARCSIN(SINE)	INLT3710
ANGDUB=2.*ANG	INLT3720
AGROSS = (W+2.*T)*(D3/2. - HAL/2. + HBLDIV)	INLT3730
ASEG=0.5*(D3/2.)**2*(ANGDUB-SIN(ANGDUB))	INLT3740
ARLDIV=AGROSS-ASEG	INLT3750
CALCULATE DIVERTER WETTED AREA	INLT3760
AREA(6)=HBLDIV*(W/2.+T)/SIN(10.*C)	INLT3770
X(6)=(W/2.+T)/2.	INLT3780
Y(6)=HBLDIV/2.	INLT3790
Z(6)=0.5*(W/2.+T)/TAN(10.*C)	INLT3800
AREA(12) = ((W/2. + T)/SIN(10.*C))*(D3/2. -HAL)/2.	INLT3810
X(12)= 2.*(W/2.+ T)/3.	INLT3820
Y(12) = HBLDIV + (D3/2.-HAL)/3.	INLT3830
Z(12)=2.*(W/2.+T)/TAN(10.*C)/3.	INLT3840
AREA (15) = AREA(6)	INLT3850
X(15) = -X(6)	INLT3860
Y(15) = Y(6)	INLT3870
Z(15) = Z(6)	INLT3880
AREA(17) = AREA(12)	INLT3890
X(17) = -X(12)	INLT3900
Y(17) = Y(12)	INLT3910
Z(17) = Z(12)	INLT3920
1692 CONTINUE	INLT3930
CALCULATE THE AFF AND FWD FAIRING PROJECTED AND WETTED AREAS	INLT3940
C XFRNG IS DISTANCE FROM END OF DUMP PORT TO END OF MISSILE AND XLFWO	INLT3950
C IS AXIAL LENGTH OF FWD FAIRING. DO FWD FAIRING FIRST.	INLT3960
IF(ITYPE.EQ.1)GO TO 1600	INLT3970
AFFPRJ=HC*(W+T+HBLDIV)	INLT3980
GO TO 1601	INLT3990
1600 AFFPRJ=W*(HC+HBLDIV+T)	INLT4000
1601 REQUIV=SQRT(2.*AFFPRJ/PI)	INLT4010
CHECK THAT AN L/D=3. CONE DOES NOT EXTEND FWD OF THE TANGENCY POINT	INLT4020
XLFWO=6.*REQUIV	INLT4030
STAFWD=XFRNG+XLDUMP+XINLET+XLFWO	INLT4040
STACHK=XTOTAL-STAFWD	INLT4050
IF(STACHK.LT.TANLT) XLFWO=XTOTAL-TANLT-(STAFWD-XLFWO)	INLT4060
IF(XLFWO.LT.(2.*REQUIV)) XLFWO=2.*REQUIV	INLT4070
XFRNG=XLFWO	INLT4080
XLBYR=XLFWO/REQUIV	INLT4090
XLBYD=XLBYR/2.	INLT4100
IF(ITYPE.EQ.1)GO TO 1817	INLT4110

AREA(34)=HC*(SQRT((W+HBLDIV+T)**2+XLFW**2))/2.	INLT4120
X(34)=2.*(W+T+HBLDIV)/3.-HBLDIV	INLT4130
Y(34)=-(T+HC/2.)	INLT4140
Z(34)=-XLFW/3.	INLT4150
AREA(37)=(W+HBLDIV+T)*(SQRT((HC/2.)**2+XLFW**2))/2.	INLT4160
X(37)=(W+T+HBLDIV)/3.-HBLDIV	INLT4170
Y(37)=-(T+2.*HC/3.)	INLT4180
Z(37)=Z(34)	INLT4190
AREA(38)=AREA(37)	INLT4200
X(38)=X(37)	INLT4210
Y(38)=-(T+HC/6.)	INLT4220
Z(38)=Z(34)	INLT4230
C FILL IN THE SIDEPLATES AND THE BOTTOM (COWL) FOR FWD FAIRING	INLT4240
AREA(41)=XC*HC/2.	INLT4250
X(41)=W+1.5*T	INLT4260
Y(41)=-(T+2.*HC/3.)	INLT4270
Z(41)=XC/3.	INLT4280
X(42)=0.	INLT4290
Y(42)=C.	INLT4300
Z(42)=C.	INLT4310
AREA(42)=0.	INLT4320
AREA(43)=W*XC	INLT4330
X(43)=T+W/2.	INLT4340
Y(43)=-(1.5*T+HC)	INLT4350
Z(43)=XC/2.	INLT4360
GO TO 2118	INLT4370
1817 AREA(34)= SQRT((W/2.)**2+XLFW**2)*(HC+T+HBLDIV)/2.	INLT4380
X(34)=W/3.	INLT4390
Y(34)=-(T+HC+HBLDIV)/3.-HBLDIV	INLT4400
Z(34)=-XLFW/3.	INLT4410
AREA(37)=AREA(34)	INLT4420
X(37)=-X(34)	INLT4430
Y(37)=Y(34)	INLT4440
Z(37)=Z(34)	INLT4450
AREA(38)=W*SQRT((HC+HBLDIV+T)**2+XLFW**2)/2.	INLT4460
X(38)=0.	INLT4470
Y(38)=-2.*(HC+T+HBLDIV)/3.-HBLDIV	INLT4480
Z(38)=Z(34)	INLT4490
AREA(40)=0.	INLT4500
X(40)=0.	INLT4510
Y(40)=0.	INLT4520
Z(40)=0.	INLT4530
AREA(41)=XC*HC/2.	INLT4540
X(41)=(W+T)/2.	INLT4550
Y(41)=-(T+2.*HC/3.)	INLT4560
Z(41)=X*PCL/3.	INLT4570
AREA(42)=AREA(41)	INLT4580
X(42)=-X(41)	INLT4590
Y(42)=Y(41)	INLT4600
Z(42)=Z(41)	INLT4610
AREA(43)=W*XC	INLT4620
X(43)=0.	INLT4630
Y(43)=-(1.5*T+HC)	INLT4640
Z(43)=XC/2.	INLT4650
2118 CONTINUE	INLT4660

CALCULATE AFT FAIRING WETTED AREA

1818 IF(ITYPE.EQ.1)GO TO 1819

AREA(36)=(HC+HPROJ+T+T)*SQRT((W+T+T+HBLDIV)**2+XFRNG**2)/2.

X(36)= 2.*(W+T+T+HBLDIV)/3. -HBLDIV

Y(36)=-(HC/2.+T)-(HC/2. + T + HPROJ)/3.

Z(36)= XINLET + XLDUMP + XFRNG/3.

X(39) =0.

Y(39) =0.

Z(39) =0.

AREA(39)=0.

AREA(35)=(W+T+T+HBLDIV)*SQRT((HC/2.+HPROJ+T)**2+XFRNG**2)/2.

X(35)= (W+T+T+HBLDIV)/3. -HBLDIV

Y(35)=-(HC/2.+T)-2.*((HC/2.+HPROJ+T)/2.)/3.

Z(35)= Z(36)

AREA(40)=(W+T+T+HBLDIV)*SQRT((HC/2.+T)**2+XFRNG**2)/2.

X(40)=X(35)

Y(40)=-(T+HC/2.)/3.

Z(40)=Z(36)

GO TO 1820

1819 AREA(36)=(HC+HPROJ+T+T+HBLDIV)*SQRT((W/2.+T)**2 +XFRNG**2)/2.

X(36)= 2.*(W/2.+T)/3.

Y(36)=-(T+HC +HPROJ +T-HBLDIV)/3.

Z(36)= XINLET + XLDUMP + XFRNG/3.

AREA(39)= AREA(36)

X(39)= -X(36)

Y(39)= Y(36)

Z(39)= Z(36)

AREA(35)=(W+T+T)*SQRT((HC+HPROJ+T+T+HBLDIV)**2+XFRNG**2)/2.

X(35)=0.

Y(35)=-2.*(T+HC+HPROJ+T-HBLDIV)/3.

Z(35)= Z(36)

1820 CONTINUE

CALCULATE THE TOTAL WETTED AREA OF THE AFT FAIRING

AWETAF = AREA(36)+ AREA(39) + AREA(35) + AREA(40)

CALCULATE THE TOTAL WETTED OF THE FORWARD FAIRING

AWETFF=AREA(34)+AREA(37)+AREA(38)+AREA(41)+AREA(42)+AREA(43)

CALCULATE THE WETTED AREA OF THE BOUNDARY LAYER DIVERTER

ADIVWT=AREA(6)+AREA(15)+AREA(12)+AREA(17)

CALCULATE THE WETTED AREA OF THE ENTIRE INLET(FORE AND AFT FAIRINGS+DUCT

AWET=AWETAF+AWETFF+AREA(1)+AREA(2)+ AREA(3)+AREA(4)+AREA(5)+

4 AREA(7)+AREA(8)+AREA(9)+AREA(10)+AREA(11)+AREA(13)+AREA(14)+

2 AREA(16)

C AWETQ IS WETTED AREA OF INLET MINUS AREA MASKED ON BODY

AWETQ = AWET - AREA(35)

IF(ITYPE .GT. 1) AWETQ=AWET-AREA(36)-AREA(16)

ADUCT=0.

DO 1112 M=1,33

1112 ADUCT=ADUCT+AREA(M)

C TEMP IS IN DEG FARENHEIT AND RHO IS LB/IN**3

IF(IND.NE.0) GO TO 1492

WGHTAF=AWETAF*RHOFRG*TFRNG

WGHTFF=AWETFF*RHOFRG*TFRNG

WGHTDU=ADUCT*RHOA*TSTART

WEIGHT=WGHTFF+WGHTAF+WGHTDU

C R/J ONLY

INLT4670

INLT4680

INLT4690

INLT4700

INLT4710

INLT4720

INLT4730

INLT4740

INLT4750

INLT4760

INLT4770

INLT4780

INLT4790

INLT4800

INLT4810

INLT4820

INLT4830

INLT4840

INLT4850

INLT4860

INLT4870

INLT4880

INLT4890

INLT4900

INLT4910

INLT4920

INLT4930

INLT4940

INLT4950

INLT4960

INLT4970

INLT4980

INLT4990

INLT5000

INLT5010

INLT5020

INLT5030

INLT5040

INLT5050

INLT5060

INLT5070

INLT5080

INLT5090

INLT5100

INLT5110

INLT5120

INLT5130

INLT5140

INLT5150

INLT5160

INLT5170

INLT5180

INLT5190

INLT5200

INLT5210

GO TO 5003	INLT5220
5007 CONTINUE	INLT5230
WTCADU=PI*2.*RENGO*TSTART*RHOA	INLT5240
IF(KIND.GT.49.AND.KIND.LT.60) WEIGHT=WEIGHT+WTCADU	INLT5250
5003 CONTINUE	INLT5260
CALCULATE THE INLET CENTER OF GRAVITY	INLT5270
XCGSUM=0.	INLT5280
YCGSUM=0.	INLT5290
ZCGSUM=0.	INLT5300
T=TSTART	INLT5310
RHO=RHOA	INLT5320
DO 8 K=1,43	INLT5330
IF(K.EQ.34) GO TO 1313	INLT5340
GO TO 1314	INLT5350
1313 T=TERNG	INLT5360
RHO=RHOFRG	INLT5370
1314 WGT(K)=AREA(K)*T*RHO	INLT5380
XCOMP=AREA(K)*T*RHO*X(K)	INLT5390
YCOMP=AREA(K)*T*RHO*Y(K)	INLT5400
ZCOMP=AREA(K)*T*RHO*Z(K)	INLT5410
C P/J ONLY	INLT5420
GO TO 5004	INLT5430
5006 CONTINUE	INLT5440
IF(KIND.GT.49.AND.KIND.LT.60) GO TO 87	INLT5450
XCGSUM=XCGSUM+0.*WTCADU	INLT5460
YCGSUM=YCGSUM+WTCADU*(HBLDIV+D3/2.)	INLT5470
ZCGSUM=ZCGSUM+WTCADU*(XINLET+RENGO)	INLT5480
87 XCG=XCGSUM/WEIGHT	INLT5490
GO TO 5005	INLT5500
5004 CONTINUE	INLT5510
XCGSUM = XCGSUM + XCOMP	INLT5520
5005 CONTINUE	INLT5530
YCGSUM=YCGSUM+YCOMP	INLT5540
8 ZCGSUM=ZCGSUM+ZCOMP	INLT5550
XCG=XCGSUM/WEIGHT	INLT5560
YCG=YCGSUM/WEIGHT	INLT5570
ZCG=ZCGSUM/WEIGHT	INLT5580
CALCULATE THE PITCH INERTIA OF EACH PIECE ABOUT ITS C.G.	INLT5590
T=TSTART	INLT5600
DO 23 IM=34,38	INLT5610
23 PIX(IM)=0.	INLT5620
PIX(1) =WGHT(1)*(HC**2+XTIPCL**2)/18.	INLT5630
PIX(2) =WGHT(2)*(XLTURN**2+HC**2)/3.	INLT5640
PIX(3) =WGHT(3)*((HPROJ+T)**2+XLTURN**2)/18.	INLT5650
PIX(4) =WGHT(4)*((X4-XC+2.*XT)**2+(HC+HPROJ+T)**2)/3.	INLT5660
PIX(5) =WGHT(5)*((HC+HPROJ+T)**2+(XLCB+XLDUMP)**2)/3.	INLT5670
PIX(7) =PIX(1)	INLT5680
PIX(8) =PIX(2)	INLT5690
PIX(9) =PIX(3)	INLT5700
PIX(10)=PIX(4)	INLT5710
PIX(11)=PIX(5)	INLT5720
PIX(13)=WGHT(13)*(XLTURN**2+(HPROJ+T)**2+TSTART**2)/3.	INLT5730
PIX(14)=WGHT(14)*((X4-XC+2.*XT+XLCB+XLDUMP)**2+TSTART**2)/3.	INLT5740
PIX(16)=WGHT(35)*((XTIPCL+XLTURN+X4-XC+2.*XT+XLCB+XLDUMP)**2+TSTART**2)/3.	INLT5750
	INLT5760

RIX(18)=WGHT(18)*((X2**2+Y2**2)/18.	INLT5770
RIX(19)=WGHT(19)*(((X3-X2)**2+(Y2**2)/3.	INLT5780
RIX(20)=WGHT(20)*(((X3-X2)**2+(Y3-Y2)**2)/18.	INLT5790
RIX(21)=WGHT(21)*(((X4-X3)**2+Y3**2)/3.	INLT5800
RIX(22)=WGHT(22)*(((X4-X3)**2+(Y4-Y3)**2)/18.	INLT5810
RIX(23)=WGHT(23)*(((X4-XC)**2+(YC-Y4)**2)/18.	INLT5820
PIX(24)=WGHT(24)*((XLTURN**2+(HPROJ+TSTART)**2)/18.	INLT5830
RIX(25)=WGHT(25)*(((XLTURN-(X4-XC))**2+HC**2)/3.	INLT5840
RIX(26)=WGHT(26)*((HC+HPRCJ)**2+(X4-XC+2.*XT+XLCB)**2)/3.	INLT5850
RIX(27)=WGHT(27)*((X2**2+Y2**2+TSTART**2)/3.	INLT5860
RIX(28)=WGHT(28)*(((X3-X2)**2+(Y3-Y2)**2+TSTART**2)/3.	INLT5870
RIX(29)=WGHT(29)*(((X4-X3)**2+(Y4-Y3)**2+TSTART**2)/3.	INLT5880
RIX(30)=WGHT(30)*((XLTURN**2+HPROJ**2+TSTART**2)/3.	INLT5890
RIX(31)=WGHT(31)*((4.*XT*XT+TSTART**2)/3.	INLT5900
RIX(32)=WGHT(32)*((HDIFF**2+XLCB**2+TSTART**2)/3.	INLT5910
IF(IYPE.EQ.1) GO TO 4444	INLT5920
PIX(36) = WGHT(36)*((HC+HPROJ+2.*TSTART)**2.+XFRNG**2)/18.	INLT5930
RIX(39)=0.	INLT5940
RIX(35)=WGHT(35)*((3.*TFRNG**2+2.*XFRNG**2)/36.	INLT5950
RIX(40)=RIX(35)*WGHT(40)/WGHT(35)	INLT5960
	INLT5970
RIX(33)=WGHT(33)*((HC+HPRCJ)**2+(XLDUMP**2+(W+T+HBLDIV)**2)/3.	INLT5980
PIX(6)=WGHT(6)*(((HC/2.+TSTART)/SIN(10.*C))**2+TSTART**2)/3.	INLT5990
RIX(15)=WGHT(15)*(((HC/2.+HPROJ+TSTART)/SIN(10.*C))**2+TSTART**2)/	INLT6000
13.	INLT6010
PIX(12)=WGHT(12)*((3.*TSTART**2+2.*((D3/2.*(1.-COS(ANGLEFU)))**2)/36	INLT6020
RIX(17)=WGHT(17)*((3.*TSTART**2+2.*((D3/2.*(1.-COS(ANGLEL)))**2)/36	INLT6030
GO TO 2223	INLT6040
4444 RIX(33)=WGHT(33)*((XLDUMP**2+(HC+HPROJ+TSTART)**2+TSTART**2)/3.	INLT6050
RIX(6)=WGHT(6)*((HBLDIV**2+ ((W/2.+TSTART)/SIN(10.*C))**2)/3.	INLT6060
RIX(15)=RIX(6)	INLT6070
RIX(12)=WGHT(12)*(((W/2.+TSTART)/SIN(10.*C))**2+(D3/2.-HAL)**2)/18.	INLT6080
RIX(17)=RIX(12)	INLT6090
RIX(36) = WGHT(36)*((XFRNG**2 + (HC+HPROJ+HBLDIV+2.*TSTART)**2)/18.	INLT6100
PIX(39) = RIX(36)	INLT6110
PIX(35)=WGHT(35)*2.*((3.*TFRNG**2+2.*((HC+HPROJ+HBLDIV+2.*TSTART)**	INLT6120
12+XFRNG**2))/36.	INLT6130
RIX(40)=0.	INLT6140
2223 CONTINUE	INLT6150
RMI=0.	INLT6160
DO 1109 IJ=1,40	INLT6170
1109 RMI=RMI+RIX(IJ)	INLT6180
CALCULATE THE TRANSFER TERM FOR EACH PIECE TO THE INLET C.G.	INLT6190
XITRAN=C.	INLT6200
T=TSTART	INLT6210
RHO=RHOA	INLT6220
DO 414 II=1,40	INLT6230
IF (II.EQ.34) GO TO 8402	INLT6240
GO TO 8403	INLT6250
8402 T=TFRNG	INLT6260
RHO=RHOFRG	INLT6270
8403 XIADD=AREA(II)*T*RHO*(((YCG-Y(II))**2+(ZCG-Z(II))**2)	INLT6280
IF(II.EQ.34.OR.II.EQ.37.OR.II.EQ.38) XIADD =0.	INLT6290
414 XITRAN=XITRAN+XIADD	INLT6300
PITCHI=RMI+XITRAN	INLT6310

C	P/J ONLY	INLT6320
	GO TO 5010	INLT6330
5011	CONTINUE	INLT6340
	PICADU=(.25*WTCADU)*((D3**2.)/4.-PENG0**2.+(4.*RENG0**2.)/3.)	INLT6350
	IF(KIND.GT.49.AND.KIND.LT.60)PITCHI=PITCHI+PICADU	INLT6360
5010	CONTINUE	INLT6370
	XDIST=XTOTAL-(XFERNG+XLDUMP+XINLET+XLFWO)	INLT6380
	XNAC=XINLET+XLDUMP+XFERNG	INLT6390
	WGHTAF=WGHTAF*XNINLT	INLT6400
	WGHTFF=WGHTFF*XNINLT	INLT6410
	WGHTDU=WGHTDU*XNINLT	INLT6420
	WEIGHT=WEIGHT*XNINLT	INLT6430
	PITCHI=PITCHI*XNINLT	INLT6440
	CONVERT FROM INLET COORDINATE SYSTEM TO MISSILE COORDINATE SYSTEM	INLT6450
	ZMISCG=-YCG	INLT6460
	XMISCG=-ZCG	INLT6470
	YMISCG=XCG	INLT6480
	IF (NOUT .NE. 1) GO TO 113	INLT6490
	WRITE(6,3004)AR,w,HC,ACPROJ,XMISCG,YMISCG,ZMISCG,XCHECK,XDUMP,	INLT6500
	1XLDUMP,XFERNG,WGHTAF,XFERNG,WGHTFF,XINLET,WGHTDU,WEIGHT,PITCHI	INLT6510
	IF (NOUT .GT. 1) WRITE(6,JONSON)	INLT6520
3004	FORMAT (10X,3HAR=,F4.2,7H WIDTH=,F5.2,12H IN HEIGHT=,F5.2,	INLT6530
	127H IN COWL PROJECTED AREA = ,F5.2,7H SQ.IN ,/,15X,	INLT6540
	2 4HXCG=,F6.2,6H YCG=,F6.2,	INLT6550
	36H ZCG=,F6.2,/,15X,30HINLET LEADING EDGE IS AT STA. ,F6.2,/,	INLT6560
	415X,32HLEADING EDGE OF DUMP IS AT STA. ,F6.2,10H. DUMP IS ,F5.2,	INLT6570
	51X,9HIN. LONG.,/,15X,15HAF FAIRING IS ,F5.2,1X,20HIN. LONG AND WE	INLT6580
	6IGHS ,F6.2,1X,3HLP.,/,15X,15HFW FAIRING IS ,F5.2,1X,	INLT6590
	720HIN. LONG AND WEIGHS ,F6.2,1X,3HLR.,/,15X,18HTHE INLET DUCT IS ,	INLT6600
	8F6.2,1X,20HIN. LONG AND WEIGHS ,F6.2,1X,18HLR(INCL. B/L DIV).,/,	INLT6610
	915X,26HTHE TOTAL INLET WEIGHT IS ,F6.2,1X,2HLR/15X,27HPITCH MOMENT	INLT6620
	A OF INERTIA IS ,F10.2,9H LB-IN SQ)	INLT6630
113	X1=X1/HC	INLT6640
	X2=X2/HC	INLT6650
	X3=X3/HC	INLT6660
	X4=X4/HC	INLT6670
	XC=XC/HC	INLT6680
	XT=XT/HC	INLT6690
	Y1=Y1/HC	INLT6700
	Y2=Y2/HC	INLT6710
	Y3=Y3/HC	INLT6720
	Y4=Y4/HC	INLT6730
	YC=YC/HC	INLT6740
114	CONTINUE	INLT6750
	RETURN	INLT6760
1452	IF (NOUT .NE. 0) WRITE (6, 1493)	INLT6770
1453	FORMAT(5X,41HERROR IN MATERIALS SUBROUTINE. NEXT CASE)	INLT6780
	RETURN	INLT6790
38	IF (NOUT .NE. 0) WRITE (6, 39) HP	INLT6800
39	FORMAT(46H ERROR TRYING TO FIND ALTITUDE DATA IN INLETP ,F15.5)	INLT6810
	RETURN	INLT6820
	END	INLT6830

	SUBROUTINE INLIFT (NRM, CLAINL, CDBON)	INLI0010
C	PCM=NUK,CM-CGSM GGJ/RKM FIV-EBCD 7/11/73	INLI0020
C	GLINT ANOMALY	INLI0030
	REAL KAR,KM	INLI0040
	DIMENSION CLINLX(1)	INLI0050
	DIMENSION BASECP(20)	INLI0060
	DIMENSION CDART1(86), CDART2(86), CDART3(86), CDART4(86),	INLI0070
1	CDART5(86), CDART6(430)	INLI0080
	EQUIVALENCE (CDART1(1), CDART6(1)), (CDART2(1), CDART6(87)),	INLI0090
1	(CDART3(1), CDART6(173)), (CDART4(1), CDART6(259)),	INLI0100
2	(CDART5(1), CDART6(345))	INLI0110
	DIMENSION X(3), NINV(3)	INLI0120
	COMMON/BASDRG/ BASEP(59)	INLI0130
	COMMON/BDTAB/ NCONF,NPRX,NRMX,NCONF,NPRXX,NRMXX	INLI0140
	COMMON /RDAT/ CDPBTL,DUM19(19)	INLI0150
	COMMON /PRINT/ JKP3(3), IOUT, JKP3(3)	INLI0160
	COMMON/INSERT/2X17(17),TNOZL,DUMXXX,RBE,INS10(10),TPL,INS2(2)	INLI0170
	COMMON /EORROW/ NR7,NALT,RMV(20),ALTV(10),FRBT,FACTOR	INLI0180
	COMMON/GOROL/ WARD(78)	INLI0190
	EQUIVALENCE (WARD(24), EPSR)	INLI0200
	EQUIVALENCE (WARD(73),TR), (WARD(74), TB)	INLI0210
	COMMON/SUMOUT/ ROPCD(20), XINCD(20), WNGCD(20), TAILCD(20),	INLI0220
1	TAXLCD(20), FRICCD(20), CDGONA(20), CDQOFA(20), CDPNAR(20),	INLI0230
2	CDDEXR1(20), CDDEXR2(20), CDBTAR(20), CDLAR(20), BDRCN(20),	INLI0240
3	CDPRDD(20), RLDVAR(20), CDCWL(20), FRGCD(20), CDPIAX(20),	INLI0250
4	CDPINT(20), CDPWAR(20), CDHTAR(20), CDVTAR(20), CDTLAR(20),	INLI0260
5	CDPLSA(20), RDPOLF(20), CDPTAR(20), CDPOFA(20)	INLI0270
	COMMON /INCOMM/XLDUMP,XFERNG,XINLET,XTIPCL,STERM,TNC	INLI0280
	EQUIVALENCE (XFERNG, XFWDA)	INLI0290
	COMMON /EXTERN/ZAP(20)	INLI0300
	EQUIVALENCE (ZAR(17), XMRJTO), (ZAR(6),XTOTAL)	INLI0310
	COMMON /CODEXX/ INIZ,ITYPE, I14(14)	INLI0320
	COMMON /INDATX/2X9(9),XCHECK,XFERNG, 2X12(12)	INLI0330
	COMMON /RJDAT/ 2X3(3),A6A3,ACA3, 2X4(4)	INLI0340
	COMMON /BASVAR/ ZAT(7), SWI, STI, ARW, ZAL0(10)	INLI0350
	COMMON /UPINLT/ PRAMBL(129), XCGD1	INLI0360
	COMMON /ALFBLK/ AMACH, AMEX13(13)	INLI0370
	COMMON/LEFT/	INLI0380
1	ATNS2T ,ATNS2W ,SEW ,SET ,DMW ,DMT ,	INLI0390
2	RL4 ,RL5 ,ALPHAR ,RITWV ,IART ,ICNTRL ,	INLI0400
3	D2 ,RL2	INLI0410
	COMMON/DRG/	INLI0420
1	D1 ,THE TAC ,FINE ,RS ,R1 ,RL1 ,	INLI0430
2	XCYL ,XTHEPT ,XRT ,RL3 ,ITN ,AMACW ,	INLI0440
3	AMACT ,THKRT ,THKRW ,RL1A ,IBTL ,ATCT ,	INLI0450
4	ATCW ,DML ,ITSECT ,IWSECT ,RXINT ,RXINW ,	INLI0460
5	BTANST ,BTANSW ,RCW ,FLTSEW ,XLENW ,FLTSET ,	INLI0470
6	XLENT ,QRATIO ,DN ,DE ,D3 ,RCT ,	INLI0480
7	NW ,TCW ,TCT ,BT ,BW ,ART ,	INLI0490
8	ARWX ,TRT ,TRW ,SREF ,DB	INLI0500
	COMMON/AFRO/	INLI0510
1	ATNS4T ,ATNS4W ,BTANA ,BART ,BARW ,BAPT ,	INLI0520
2	BAPW ,BAPPT ,BAPPW ,BETA ,BFN ,CFT ,	INLI0530
3	CFW ,CDB ,CFR ,CNANAC ,CLABT ,CLAT ,	INLI0540
4	CLAW ,CLTV ,CKWB ,CKBW ,CKBT ,CKTB ,	INLI0550

5	CLATWV	,D	,DD	,DD2	,DPR	,DHL	,	INLI0560
6	FAFN	,F	,FL	,FR	,PI	,RLD	,	INLI0570
7	RLDP	,RBTANA	,SLETR	,SLEWR	,STSREF	,SWSREF	,	INLI0580
8	SKRT	,SKTB	,SKBW	,SKWB	,TRTP1	,TRWPI	,	INLI0590
9	CFI	,TANST	,TANSW	,TANS4T	,TANS4W	,TANS2T	,	INLI0600
A	TANS2W	,XD1B	,XD1BT	,XD1T	,XD1W	,XNLCLB	,	INLI0610
P	XNLCLB	,ACT	,ACW	,XNLCLB	,BODYL	,TAILL	,	INLI0620
C	WINGL	,RLISQR	,DISQR	,FR1	,FCAP	,CDPNX	,	INLI0630
D	ACAP	,TN1	,SPN	,VPN	,FAFN1	,PMN	,	INLI0640
E	AN0SE2	,SWSBN	,RNOSE2	,XLINF	,CR2	,NCON(3)	,	INLI0650
F	CRFMAX	,CRAMAX	,B2	,CNVR	,BI	,B7	,	INLI0660
G	SV2	,SLEI	,SLEZ	,XVA	,XVB	,XVC	,	INLI0670
H	CT2	,CX	,VOLN	,VOLBT	,VOLBOD	,SWBREF	,	INLI0680
I	RRAT	,RUG						INLI0690
	COMMON/CHK/CON1,KAR,KM							INLI0700
	NAMLIST/CHECK/ APN,SEN,TRN,ATNS2N,BARN,AICLN,THKRN,RXINN,							INLI0710
	ISLEN,RTANSN,CNRN,DELNN, CON1,KM,KAR							INLI0720
	NAMLIST/OUTPUT/RN,RCN,TCN,SLEN,XCPI,CLAM,ARN,							INLI0730
	ICPROFF,CLATWV,RM,CLAIWV,CMAN,CNBN							INLI0740
	NAMLIST/INPUT/YMRJTO,STERM,XINLET,XLDUMP,XFRNG,XTOTAL,D3,							INLI0750
	IACA3,A3,SREF,XTIPCI,ITYPE,XFWDA,XDIT,CLAT, RMV,D1,XCHECK,							INLI0760
	2SET,FRRT,BT,TRT,TNOZL,FACTOR,A6A3,XCGD1,ART							INLI0770
	NAMLIST/CKOUT/ ACPR,DJAM,STERM,HBLDIV,RN,RCN,TCN,FPSR,							INLI0780
	1 XLAH,XLE,XLEN,CLAM,CLAIN,CLAINX,ACA3,AC,X,NINV							INLI0790
1CC2	FORMAT(/I3, 2X, 6HINTWDD, 2H, ,							INLI0800
1	6H XCPI, 2H =, F10.3, 2H, , 6H CLAN, 2H =, E10.3, 2H, ,							INLI0810
2	6H CLAM, 2H =, F10.3, 2H, , 6H CKNR, 2H =, E10.3, 2H, ,							INLI0820
3	6H CKRN, 2H =, F10.3, 2H, , 6HCLAINL, 2H =, E10.3)							INLI0830
	DATA BASECP/							INLI0840
1	0.0, -.137, 0.8, -.137, 0.9, -.145, 1.0, -.195, 1.2, -.191,							INLI0850
1	1.5, -.172, 2.0, -.141, 3.0, -.092, 4.0, -.065, 5.0, -.048/							INLI0860
	DATA CDART1/ 1.000,							INLI0870
1	0.000, 0.480, 0.025, 0.570, 0.050, 0.600,							INLI0880
2	0.075, 0.620, 0.100, 0.600, 0.150, 0.580,							INLI0890
3	0.200, 0.510, 0.250, 0.480, 0.300, 0.440,							INLI0900
4	0.350, 0.380, 0.400, 0.320, 0.450, 0.250,							INLI0910
5	0.500, 0.210, 0.550, 0.160, 0.600, 0.130,							INLI0920
6	0.650, 0.110, 0.700, 0.090, 0.800, 0.060,							INLI0930
7	0.850, 0.040, 0.950, 0.000, 1.000, 0.000,							INLI0940
8	2.000,							INLI0950
9	0.000, 1.740, 0.025, 1.640, 0.050, 1.540,							INLI0960
A	0.075, 1.440, 0.100, 1.340, 0.150, 1.200,							INLI0970
B	0.200, 1.070, 0.250, 0.940, 0.300, 0.810,							INLI0980
C	0.350, 0.700, 0.400, 0.590, 0.450, 0.500,							INLI0990
D	0.500, 0.420, 0.550, 0.350, 0.600, 0.290,							INLI1000
E	0.650, 0.210, 0.700, 0.170, 0.800, 0.090,							INLI1010
F	0.900, 0.020, 0.950, 0.010, 1.000, 0.000/							INLI1020
	DATA CDART2/ 3.000,							INLI1030
1	0.000, 2.460, 0.025, 2.250, 0.050, 2.020,							INLI1040
2	0.075, 1.890, 0.100, 1.760, 0.150, 1.540,							INLI1050
3	0.200, 1.340, 0.250, 1.170, 0.300, 1.010,							INLI1060
4	0.350, 0.870, 0.400, 0.720, 0.450, 0.600,							INLI1070
5	0.500, 0.500, 0.550, 0.410, 0.600, 0.320,							INLI1080
6	0.650, 0.250, 0.700, 0.200, 0.800, 0.090,							INLI1090
7	0.900, 0.020, 0.950, 0.010, 1.000, 0.000,							INLI1100

R	4.000,						INLI1110
S	0.000,	2.990,	0.025,	2.600,	0.050,	2.380,	INLI1120
A	0.075,	2.220,	0.100,	2.060,	0.150,	1.780,	INLI1130
B	0.200,	1.560,	0.250,	1.350,	0.300,	1.170,	INLI1140
C	0.350,	1.000,	0.400,	0.860,	0.450,	0.700,	INLI1150
D	0.500,	0.570,	0.550,	0.460,	0.600,	0.360,	INLI1160
E	0.650,	0.290,	0.700,	0.240,	0.800,	0.090,	INLI1170
F	0.900,	0.020,	0.950,	0.010,	1.000,	0.000/	INLI1180
DATA CDART3/	5.000,						INLI1190
1	0.000,	3.320,	0.025,	3.010,	0.050,	2.650,	INLI1200
2	0.075,	2.460,	0.100,	2.270,	0.150,	1.970,	INLI1210
3	0.200,	1.710,	0.250,	1.480,	0.300,	1.260,	INLI1220
4	0.350,	1.080,	0.400,	0.910,	0.450,	0.770,	INLI1230
5	0.500,	0.620,	0.550,	0.510,	0.600,	0.410,	INLI1240
6	0.650,	0.310,	0.700,	0.240,	0.800,	0.110,	INLI1250
7	0.900,	0.030,	0.950,	0.020,	1.000,	0.000,	INLI1260
8	6.000,						INLI1270
9	0.000,	3.720,	0.050,	2.960,	0.100,	2.470,	INLI1280
A	0.150,	2.110,	0.200,	1.840,	0.250,	1.600,	INLI1290
B	0.300,	1.390,	0.350,	1.170,	0.400,	0.990,	INLI1300
C	0.450,	0.840,	0.500,	0.700,	0.550,	0.540,	INLI1310
D	0.600,	0.450,	0.650,	0.340,	0.700,	0.240,	INLI1320
E	0.750,	0.160,	0.800,	0.110,	0.850,	0.060,	INLI1330
F	0.900,	0.030,	0.950,	0.020,	1.000,	0.000/	INLI1340
DATA CDART4/	8.000,						INLI1350
1	0.000,	4.250,	0.025,	3.750,	0.050,	3.270,	INLI1360
2	0.075,	3.020,	0.100,	2.760,	0.150,	2.380,	INLI1370
3	0.200,	2.040,	0.250,	1.760,	0.300,	1.520,	INLI1380
4	0.350,	1.300,	0.400,	1.090,	0.450,	0.910,	INLI1390
5	0.500,	0.760,	0.550,	0.600,	0.600,	0.480,	INLI1400
6	0.650,	0.370,	0.700,	0.270,	0.800,	0.130,	INLI1410
7	0.900,	0.040,	0.950,	0.010,	1.000,	0.000,	INLI1420
8	10.000,						INLI1430
9	0.000,	5.000,	0.025,	4.270,	0.050,	3.560,	INLI1440
A	0.075,	3.280,	0.100,	2.990,	0.150,	2.560,	INLI1450
B	0.200,	2.210,	0.250,	1.910,	0.300,	1.630,	INLI1460
C	0.350,	1.390,	0.400,	1.160,	0.450,	0.970,	INLI1470
D	0.500,	0.820,	0.550,	0.660,	0.600,	0.520,	INLI1480
E	0.650,	0.410,	0.700,	0.270,	0.800,	0.140,	INLI1490
F	0.900,	0.040,	0.950,	0.010,	1.000,	0.000/	INLI1500
DATA CDART5/	16.000,						INLI1510
1	0.000,	5.600,	0.025,	5.000,	0.050,	4.100,	INLI1520
2	0.075,	3.700,	0.100,	3.340,	0.150,	2.910,	INLI1530
3	0.200,	2.500,	0.250,	2.160,	0.300,	1.860,	INLI1540
4	0.350,	1.630,	0.400,	1.360,	0.450,	1.140,	INLI1550
5	0.500,	0.920,	0.550,	0.750,	0.600,	0.580,	INLI1560
6	0.650,	0.440,	0.700,	0.320,	0.800,	0.140,	INLI1570
7	0.900,	0.040,	0.950,	0.010,	1.000,	0.000,	INLI1580
8	20.000,						INLI1590
9	0.025,	4.990,	0.050,	4.500,	0.100,	3.750,	INLI1600
A	0.150,	3.150,	0.200,	2.750,	0.250,	2.380,	INLI1610
B	0.300,	2.040,	0.350,	1.740,	0.400,	1.470,	INLI1620
C	0.450,	1.200,	0.500,	1.000,	0.550,	0.800,	INLI1630
D	0.600,	0.630,	0.650,	0.490,	0.700,	0.360,	INLI1640
E	0.750,	0.250,	0.800,	0.150,	0.850,	0.080,	INLI1650

	F	0.900,	C.040,	0.950,	0.010,	1.000,	0.000/	INL11660
C		DATA COPIED FROM PKL1 (DAT18)						INL11670
		PI = 3.141593						INL11680
		C = PI / 180.						INL11690
		FPR = 57.29578						INL11700
		KRYXIN=C						INL11710
		CDPRTL=C.0						INL11720
		ALT=1.						INL11730
		ALPHAR=C.						INL11740
		APWX = APW						INL11750
		CDNRTL=C.0						INL11760
		A3 = 7AR(12)						INL11770
		A3 = A3 * 144.						INL11780
		SREF = A3						INL11790
		D3 = ZAP(3)						INL11800
		D1 = D3						INL11810
		R1=D1/2.						INL11820
		IF(KRYXIN .EQ.0) GO TO 4900						INL11830
		XMINLT=ITYPE						INL11840
		AC=ACA3*A3						INL11850
		ACPER=AC/XMINLT						INL11860
		DIAM=SQRT(4.*ACPER/PI)						INL11870
		STERM=EBLDIV + DIAM						INL11880
		BN=2.*STERM						INL11890
4900		CONTINUE						INL11900
		R13 = XTOTAL						INL11910
		IF (IOUT.EQ.1) WRITE(6,INPUT)						INL11920
		DO 100 J=1,NRM						INL11930
		RM=RMV(J)						INL11940
		IF (NRM .LE. 1) RM = AMACH						INL11950
		XLE=XLEDCE * D3						INL11960
		XLEN=XTOTAL - XLE						INL11970
		IF(KRYXIN .EQ. 1) GO TO 202						INL11980
		IF(ITYPE.NE.2) GO TO 5000						INL11990
		IF(PM.LT.XMRJTD) GO TO 5100						INL12000
		BN=STERM*2.0						INL12010
		RCN=XINLET + XLDUMP + C.5*XFRNG						INL12020
		TCN=PCN						INL12030
		IF(KRYXIN .NE. 2) GO TO 483						INL12040
		XLAH=C.5*D3/FPSR						INL12050
		PCN=XLEN - C.5*XFRNG						INL12060
		TCN=PCN						INL12070
483		CONTINUE						INL12080
		SLEN=0.0						INL12090
		THKPN=0.05						INL12100
		RXINN=0.5						INL12110
		XCPI = XCHECK / D3						INL12120
		SFN=2.0*PCN*STERM						INL12130
		CLAM=2.0*ACA3*A3/(57.296*SREF)						INL12140
		GO TO 5300						INL12150
5000		IF(PM.LT.XMRJTD) GO TO 5200						INL12160
		CLAINL=0.0						INL12170
		CLAM=2.0*ACA3*A3/(57.296*SREF)						INL12180
		IF(KRYXIN .EQ.2) GO TO 5040						INL12190
		RCN=XINLET + XLDUMP + C.5*XFRNG + XTIPCL						INL12200

TCN=RCN - XTIPCL	INL12210
SIEN=ATAN(STERM/XTIPCL)	INL12220
GO TO 5050	INL12230
5040 RCN=XLEN -0.5*XFRNG	INL12240
TCN=RCN	INL12250
SLEN=0.0	INL12260
5050 CONTINUE	INL12270
THRN=0.05	INL12280
RXINN=0.5	INL12290
XCPI = XCHECK / D3	INL12300
SEN= (RCN + TCN)*STERM	INL12310
PN =2.*STERM	INL12320
ARN=RN*BN/SEN	INL12330
GO TO 5300	INL12340
5100 CLAM=0.0	INL12350
IF(KRYX IN .EQ.2) GO TO 5150	INL12360
RCN=XINLET + XLDUMP + XFWDA + 0.5*XFRNG	INL12370
TCN=RCN - XFWDA	INL12380
RN=STERM*2.0	INL12390
SLEN=0.	INL12400
IF (XFWDA .GT. 0.) SLEN = ATAN(STERM / XFWDA)	INL12410
GO TO 5160	INL12420
5150 CLAM=2.0*ACA3*A3/(57.296*SREF)	INL12430
RCN=XLEN - 0.5*XFRNG	INL12440
TCN=RCN	INL12450
SLEN=0.0	INL12460
5160 CONTINUE	INL12470
THRN=0.05	INL12480
RXINN=0.5	INL12490
RXINN=0.5	INL12500
XCPI = XCHECK / D3	INL12510
SEN=0.5*(RCN + TCN)*RN	INL12520
GO TO 5300	INL12530
5200 CLAM=0.0	INL12540
CLAI=0.0	INL12550
RCN=XINLET + XLDUMP +0.5*XFRNG + XFWDA	INL12560
TCN=RCN-XFWDA	INL12570
SLEN=0.	INL12580
IF (XFWDA .GT. 0.) SLEN = ATAN(STERM / XFWDA)	INL12590
GO TO 5050	INL12600
5300 ARN=RN*RN/SEN	INL12610
C***** SWEEP ANGLE LIMIT OF 62.5 DEG. *****	INL12620
C	INL12630
IF(SLEN.GT.1.0908) SLEN = 1.0908	INL12640
TRN = TCN/RCN	INL12650
SVAL = SLEN	INL12660
IF (SVAL.EQ.0.0) SVAL=C.01	INL12670
TANSN = TAN(SVAL)	INL12680
TANS2N = TANSN+(TCN-RCN)/BN	INL12690
ATNS2N = ARN*TANS2N	INL12700
BETA = SQRT(ABS(RM*RM-1.0))	INL12710
PARN = BETA*ARN	INL12720
BTANSN = BETA/TANSN	INL12730
ALSRN = 0.	INL12740
CNASN = 0.	INL12750

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ALPT = 0.
DFM = 0.
VMN = RM*SQRT(1.-(SIN(SLEN)**2))
DDELN = ATAN(THKRN/(RXINN+RXINN))
DELNN = DPR*DDELN/COS(SLEN)
C ***** LINEAR LIFT DUE TO NACELLES *****
C
C CALL LXFT1(ARN,SEN,TRN,ATNS2N,BARN,AICLN,THKRN,RXINN,SLEN,
1      BTANSN,CNPN,DELNN,CLAN,RM)
IF ( IOUT.EQ.1) WRITE(6,CHECK)
IF(RM.GE.1.0.AND.RM.LE.1.65) KM=0.35 + 1.*(RM-1.)
IF(PM.GT.1.65.AND.RM.LE.2.1) KM=1.
IF(PM.GT.2.1.AND.PM.LE.3.65) KM=1.-0.515*(RM-2.1)
IF(RM.GT.3.65.AND.RM.LE.5.0) KM= .2-.148*(RM-3.65)
IF(RM.GT.5.) KM=C.
KAR=-.2468 + .2463/ARN
CLANI=CLAN/(1. + KM*KAR)
TRNP1 = TRN+1.0
BAPN = 0.0
IF (PM.NE.1.0) BAPN=BARN*TRNP1*(1.0+1.0/BTANSN)
RLLN=XCHECK -XFWCA
IF(PM.GE.XMRJTD) RLLN=XCHECK
DMNN = D3
C ***** CAPRYOVER TERMS *****
C
C CALL LXFT2(BTANSN,TRNP1,RCN,DMNN,ARN,PN,BAPN,BARN,CLAN,AICLN,
1      RLLN,CKNR,CKBN,RM)
C ***** TOTAL LINEAR NACELLE LIFT *****
C
CLAINL=CLANI*(CKNR + CKBN) + CLAM
IF(ITYPE.EQ.1) CLAINL = CLAM
I = 3
IF ( IOUT.EQ.1) WRITE(6,1002) I,XCPI,CLAN,CLAM,CKNR,CKBN,CLAINL
CLI = 0.
CNNE = 0.
CNAAN = 0.
IV=2
LINEAP=1
DW1=0.
DMW=D3
FMT=D3
AFL=XCHECK
IF(ITYPE.EQ.1) GO TO 2020
IF(ITYPE.EQ.2) CYBI=CLAM
IF(ITYPE.EQ.2) XCPIY=XCHECK
GO TO 203
202 CONTINUE
C BYPASS LIFT HACK ---- USE TLU
CLAIN = 0.
IF ( ITYPE .LE. 1 ) GO TO 3009
NVAR=3
NINV(1)=NCLAC

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	NINV(2)=NCLLT	INLI3310
	NINV(3)=NCLMAC	INLI3320
C	LIFT BASED ON 2 SIDE INLETS	INLI3330
	ACX = 2. * AC / XNINLT	INLI3340
	XLF = XLEDGE * D3	INLI3350
	XLEN = XTOTAL - XLF	INLI3360
	X(1) = A2 * X	INLI3370
	X(2)=XLFM	INLI3380
	X(3)=RM	INLI3390
	CALL FASTF(NVAR,NINV,CLINLX(1),X,CLAIN)	INLI3400
30C9	CONTINUE	INLI3410
	CLAM=2.*ACA3*AC/(57.296*SREF)	INLI3420
	CLAINL=CLAIN + CLAM	INLI3430
2020	CONTINUE	INLI3440
	CLATWV=0.0	INLI3450
	IF(ITYPE.EQ.1) XCPIY=XCPI	INLI3460
	IF(ITYPE.FQ.1) CYP1=0.5*CLAN*(CKBN + CKNB) + CLAM	INLI3470
C.....	BOATTAIL GEOMETRY	INLI3480
203	CONTINUE	INLI3490
	CMAN=CLAINL*(XCGD1-XCPI)*57.296	INLI3500
	CMBN=CYP1*(XCGD1-XCPIY)*57.296	INLI3510
	XBT=FRBT*D1	INLI3520
	DE = SORT (4. * A6A3 * A3 / PI)	INLI3530
	CP=DE + FACTOR*(D3-DE)	INLI3540
	IF(XBT.GT.TNOZL+1.) XBT=TNOZL+1.	INLI3550
	IF(DB.LT.D3) GO TO 205	INLI3560
	CP=D3	INLI3570
	GO TO 207	INLI3580
205	CONTINUE	INLI3590
	IF(IRTL.EQ.0) GO TO 206	INLI3600
	RL2=XTOTAL-XBT	INLI3610
	TANBT=(D1-DB)*0.5/(XTOTAL-RL2)	INLI3620
	IF(TANBT.GE.0.286) TANBT=0.286	INLI3630
C.....	MAXIMUM BOATTAIL ANGLE IS 17 DEG.....	INLI3640
	CP=D1-2.*(XTOTAL-RL2)*TANBT	INLI3650
	THETBT=ATAN((D1-DB)/(2.*XBT))	INLI3660
	R1=D1/2.	INLI3670
	XTHETBT=R1/TAN(THETBT)	INLI3680
	GO TO 207	INLI3690
206	CONTINUE	INLI3700
	THETBT=0.0	INLI3710
	XBT=0.0	INLI3720
	CP=D1	INLI3730
207	CONTINUE	INLI3740
C	ADJUST BOATTAIL CDD FOR CHANGE IN NOZ LT	INLI3750
	RLD=XBT/D3	INLI3760
	RLDB=2.*RLD/BETA	INLI3770
	CD=DB/D3	INLI3780
	CD2=CD*DD	INLI3790
	IF(IRTL.EQ.0) GO TO 760	INLI3800
	CALL BLIN(10,21,CDABT6(1),RLDB,DD2,CDA)	INLI3810
	CDPRTL=.25*CDA*(1./RLD)**2	INLI3820
	IF(CDPRTL.LT.0.0) CDPRTL=0.0	INLI3830
760	CONTINUE	INLI3840
		INLI3850

IF(INI7.EQ.45) GO TO 1176	INLI3860
AR=(DR**2-DE**2)/D3**2	INLI3870
CALL LINE(10, RM, BASEP(1), CPBASE)	INLI3880
CDRON=-CPBASE*AR*DB/D3	INLI3890
CDROFF=-CPBASE*DR**3/D3**3	INLI3900
IF (IOUT.EQ.1) WRITE(6, OUTPUT)	INLI3910
GO TO 100	INLI3920
1176 CONTINUE	INLI3930
R3=0.5*D1	INLI3940
R4=R3 - TR - TR	INLI3950
SRA=PI*(R3**2 - R4**2)	INLI3960
SFR=PI*RBF**2	INLI3970
SART=PI*(RBF + 2*TR + TBL)**2	INLI3980
SAB= SART - SER	INLI3990
PT4P0= 0.0	INLI4000
X(1)=1.	INLI4010
X(2)=PT4P0	INLI4020
X(3)=RM	INLI4030
NVAR=3	INLI4040
NINV(1)=NCONF	INLI4050
NINV(2)=NPRX	INLI4060
NINV(3)=NRMX	INLI4070
CALL FASTF(NVAR, NINV, BASEP(1), X, PBPINF)	INLI4080
CPBASE=(PBPINF - 1.)/(0.7*RM**2)	INLI4090
CDROFF=-CPBASE	INLI4100
CDHANN=-CPBASE*SBA/SREF	INLI4110
PT4P0= 1.0	INLI4120
X(1)=2.	INLI4130
X(2)=PT4P0	INLI4140
X(3)=RM	INLI4150
NVAR=3	INLI4160
NINV(1)=NCONF-X	INLI4170
NINV(2)=NPRYX	INLI4180
NINV(3)=NRMXX	INLI4190
CALL FASTF(NVAR, NINV, BASEP(1), X, PRPINF)	INLI4200
CPBASE=(PRPINF - 1.)/(0.7*RM**2)	INLI4210
CDRR=-CPBASE*SART/SREF	INLI4220
CDRASE=CDHANN + CDRR	INLI4230
CDRON=CDBASE	INLI4240
JJ = 1	INLI4250
CDROFF(JJ)=CDROFF	INLI4260
CDRON(JJ)=CDRON	INLI4270
100 CONTINUE	INLI4280
RETURN	INLI4290
END	INLI4300
SUBROUTINE ISEN (TAMB, PAMB, XMINF, TTOT, PTOT)	ISEN0010
COMMON /FUNOVR/ MODEL	ISEN0020
COMMON /FAILUR/ KFAIL	ISEN0030
CP(T)=A+B*T+C*T**2+D*T**3+E*T**4	ISEN0040
ENTH(T)=A*T+B/2*T**2+C/3*T**3+D/4*T**4+E/5*T**5	ISEN0050
PHI(T)=A*ALOG(T)+P*T+C/2*T*T+D/3*T**3+F/4*T**4	ISEN0060
IF(XMINF .LE. 0) GO TO 26	ISEN0070

GC=32.17	ISEN0080
R=0.06855	ISEN0090
A=0.249799	ISEN0100
P=-0.514602E-04	ISEN0110
C=0.742775E-07	ISEN0120
E=-0.270999E-10	ISEN0130
E=0.312467E-14	ISEN0140
N=0	ISEN0150
M=0	ISEN0160
VELSQ=CP(TAMB)*R/(CP(TAMB)-R)*GC*TAMB*XMINF**2	ISEN0170
TGUESS=(1.+2*XMINF**2)*TAMB	ISEN0180
4 F=VELSQ/2./GC-FNTH(TGUESS)+FNTH(TAMB)	ISEN0190
FPR=CP(TGUESS)	ISEN0200
TNEW=TGUESS+F/FPR	ISEN0210
IF (ABS(F).LT.1.E-04*VELSQ/64.) GO TO 5	ISEN0220
N=N+1	ISEN0230
IF(N.GT.50) GO TO 50	ISEN0240
TGUESS=TNEW	ISEN0250
GO TO 4	ISEN0260
5 IF (ABS(F/FPR).LT.1.E-04*TGUESS) GO TO 6	ISEN0270
M=M+1	ISEN0280
IF(M.GT.50) GO TO 60	ISEN0290
TGUESS=TNEW	ISEN0300
GO TO 4	ISEN0310
6 TTOT=TNEW	ISEN0320
PTOT=EXP(1./R*(PHI(TTOT)-PHI(TAMB))+ALOG(PAMB))	ISEN0330
RETURN	ISEN0340
50 WRITE(6,51)	ISEN0350
GO TO 26	ISEN0360
51 FORMAT(37H FAILURE TO CONVERGE ON F IN 50 TRYS)	ISEN0370
60 WRITE(6,61)	ISEN0380
GO TO 26	ISEN0390
61 FORMAT(41H FAILURE TO CONVERGE ON F/FPR IN 50 TRYS)	ISEN0400
26 WRITE(6,27) TAMB,PAMB,XMINF	ISEN0410
27 FORMAT(21H FATAL ERROR IN ISEN ,3F10.5)	ISEN0420
IF (MODEL .GT. 0) CALL ERRORT	ISEN0430
KFAIL = 19	ISEN0440
RETURN	ISEN0450
END	ISEN0460

SUBROUTINE MATLS(N,TEMP,RHO,FTU,FTY,IND)	MATL0010
COMMON /CODEXX/ CUNTX(14), NOUT, CUNXX	MATL0020
COMMON /MATTP/ IP(3)	MATL0030
DIMENSION IA(39)	MATL0040
DIMENSION F(234)	MATL0050
DIMENSION	MATL0060
IA1(9),A2(9),B1(9),B2(9),C1(9),C2(9),D1(9),D2(9),E1(9),E2(9),G1(9),	MATL0070
IG2(9),H1(9),H2(9),P1(9),P2(9),Q1(9),Q2(9),R1(9),R2(9),S1(9),S2(9),	MATL0080
IT1(9),T2(9),U1(9),U2(9)	MATL0090
EQUIVALENCE	MATL0100
1(F(1),A1(1)),(F(10),A2(1)),	MATL0110
X(F(37),C1(1)),	MATL0120
2(F(46),C2(1)),(F(55),D1(1)),(F(64),D2(1)),(F(73),E1(1)),(F(82),	MATL0130

3F2(1)), (F(91),G1(1)), (F(100),G2(1)), (F(109),H1(1)), (F(118),H2(1)), MATL0140
 4(F(127),P1(1)), (F(136),P2(1)), (F(145),Q1(1)), (F(154),Q2(1)), MATL0150
 5(F(163),R1(1)), (F(172),R2(1)), (F(181),S1(1)), (F(190),S2(1)), MATL0160
 6(F(199),T1(1)), (F(208),T2(1)), (F(217),U1(1)), (F(226),U2(1)) MATL0170
 DATA A1/ 152.99705,-.049888,2.13696E-4,-8.2522E-7,1.52693F-9, MATL0180
 1 -1.407076E-12,4.665609E-16,0.0,0.283 / MATL0190
 DATA A2/ 135.9983,-5.944122E-2,1.454094E-4,-2.73208E-7,1.02257E-10 MATL0200
 1,C.0, 0.0, 0.0, 1000. / MATL0210
 DATA R1/ 203.7239,-3.100867E-2,-1.25551E-4,5.11357E-7,-7.41407E-10 MATL0220
 1,2.961335E-13,0.0,0.0, 0.283 / MATL0230
 DATA R2/ 181.2644,-8.300459E-2, 1.89241E-4,-3.3780E-7,1.19098F-10, MATL0240
 1 0.0, 0.0, C.0, 1000. / MATL0250
 DATA C1/ 290.3191,-.12987056,-7.24945E-5, 1.41215F-6,3.77801E-9, MATL0260
 1 4.048478E-12,-1.623592E-15, 0.0, 0.289 / MATL0270
 DATA C2/ 275.6873,-.1133691, -2.597554E-4,2.86207E-6,-9.20084E-9, MATL0280
 11.4206311F-11,-1.0782391F-14,3.154253E-18,1000. / MATL0290
 DATA C1/ 195.3443,-.061816575,-1.637407F-4,1.89322E-6,-7.62791E-9, MATL0300
 11.3905308E-11,-1.1618146F-14,3.576743E-18,.282 / MATL0310
 DATA D2/ 175.1215,-.060111575,-1.241584F-4,1.41779E-6,-5.80028E-9, MATL0320
 11.0800203F-11,-9.2362192E-15,2.901658F-18,900. / MATL0330
 DATA E1/ 66.51792,-.037726844,2.9246608E-4,2.01661F-6,-5.89264F-8, MATL0340
 13.9270274F-10,-1.2484814E-12,2.081114F-15,0.101 / MATL0350
 DATA E2/ 59.27372,-.043642571,3.2877813F-4,3.22568F-6,-6.25410F-8, MATL0360
 13.5731961F-10,-1.0335669E-12,1.621736F-15,600. / MATL0370
 DATA G1/ 34.54856,-.04001656,8.2877353E-5,7.590633F-7,-1.33613F-8, MATL0380
 14.8648100E-11,-6.9477352E-14,3.5370061E-17,0.0639 / MATL0390
 DATA G2/ 16.10745,-.01029623,-3.979167F-5,9.029109F-8,-3.57722E-9, MATL0400
 11.6488368E-11,-2.6801702F-14,1.4940091F-17,600. / MATL0410
 DATA H1/ 145.2341,-.14093739,1.6113261E-5,4.811171E-7,-7.18078F-10 MATL0420
 1,2.8841457E-13, C.0, 0.0, 0.160 / MATL0430
 DATA H2/ 136.6050,-.12686628,-4.909786F-5,3.45276F-7,-2.502381F-10 MATL0440
 1,0.0,0.0,0.0,1000. / MATL0450
 DATA P1/ 173.6735,-.05684414,8.812214F-5,-2.310598E-7,3.84947E-10, MATL0460
 1 -2.6162994F-13,5.6401134E-17,0.0,0.298 / MATL0470
 DATA P2/ 131.1341,-.01158903,-1.285113E-5,6.885753E-9,3.01953F-11, MATL0480
 1 -2.1657085F-14,0.0,0.0,1600. / MATL0490
 DATA Q1/ 102.8955,-.13056587,-9.620951E-6,1.057358E-6,-3.66373F-9, MATL0500
 1 6.9954301F-12,-8.4032004E-15,6.5164281F-18,0.343 / MATL0510
 DATA Q2/ 76.48695,-.06191594,1.3838113F-5,3.737935E-9,-3.41328E-11 MATL0520
 1,1.0753036F-14,-1.1906212E-18,0.,2700. / MATL0530
 DATA R1/ 45.67787,-.00615185,4.7676774E-5,-3.89959E-7,-7.85595E-9, MATL0540
 1 3.3828028E-11,-2.69604737E-14,0.0,0.065 / MATL0550
 DATA R2/ 23.80382,-.01231640,3.4280666F-4,-3.21623E-6,8.633277E-9, MATL0560
 1-7.6568051E-12, C.0,0.0, 400. / MATL0570
 DATA S1/153.09017,-.03369314,7.1339100E-6,-1.84397F-6,8.241123E-9, MATL0580
 1-1.4201600E-11,9.2309419E-15,0.,0.072 / MATL0590
 DATA S2/120.51821,.004342844,-1.791805E-5,-2.28520E-6,1.043232E-8, MATL0600
 1-1.8433592F-11,1.2126769E-14,0.0,500. / MATL0610

C A	AISI 150 PSI STEEL	CODE 1	MATL0620
C B	AISI 200 PSI STEEL	CODE 2	MATL0630
C C	300 GR MARAGING STEEL	CODE 3	MATL0640
C D	17-4 PH STAINLESS	CODE 4	MATL0650
C E	2014-T6 ALUMINUM	CODE 5	MATL0660
C G	AZ31B-MAGNESIUM	CODE 6	MATL0670
C H	6AL-4V TITANIUM	CODE 7	MATL0680

C P	REFE 41	CODE 8	MATL0690
C Q	WC129Y COLUMBIUM	CODE 9	MATL0700
C R	GLASS FABRIC EPOXY LAMINATE	CODE 10	MATL0710
C S	FILAMENT WOUND GLASS EPOXY	CODE 11	MATL0720
C T	USER INPUT	CODE 12	MATL0730
C U	USER INPUT	CODE 13	MATL0740
C X1(75	DENSITY 1P/IN**3		MATL0750
C X2(9)	MAXIMUM TEMP		MATL0760
	DATA IA/ 4H150P, 4HSI S, 4HTEEL, 4H200P, 4HSI S, 4HTEEL, 4H300M, 4HAR S,		MATL0770
	14HTEEL, 4H17-4, 4H STA, 4HNLES, 4H2014, 4H-T6 , 4HALUM,		MATL0780
	24HAZB1, 4HR-0 , 4H MAG, 4H6AL-, 4H4V T, 4HITAN, 4HRENE, 4H 41 , 4H ,		MATL0790
	34HWC12, 4H9Y C, 4HOLUM, 4HGLAS, 4H FAB, 4HRIC , 4HFIL , 4HWCUN, 4HDX ,		MATL0800
	44HUSER, 4H INP, 4HUT 1, 4HUSER, 4H INP, 4HUT 2/		MATL0810
	J=18*(N-1)		MATL0820
	JMAT =3*(N-1)		MATL0830
	IF(N.GT.13 .OR. N.LT.1) GO TO 25		MATL0840
	DO 2 I=1,3		MATL0850
2	IR(I) =IA(JMAT+I)		MATL0860
	IF(N.LT.12) GO TO 5		MATL0870
	IF(F(J+9).LT..001.OR.F(J+9) .GT.1. .OR.F(J+18).LT.200. .OR.F(J+18)		MATL0880
	1.GT. 5000.) GO TO 25		MATL0890
5	TMAX = F(J+18)		MATL0900
	IF(TEMP.GT. TMAX) GO TO 10		MATL0910
	IF(TEMP.LT.-65.) TEMP= -65.		MATL0920
20	RHO= F(J+9)		MATL0930
	FTU= 0.		MATL0940
	FTY= 0.		MATL0950
	TT= 1.		MATL0960
	DO 30 I=1,8		MATL0970
	FTY = FTY + F(J+9+I)*TT		MATL0980
	FTU = FTU+F(J+I)*TT		MATL0990
30	TT= TT*TEMP		MATL1000
	IF(N.EQ.5) GO TO 34		MATL1010
	IF(N.EQ.9) GO TO 37		MATL1020
35	FTU =FTU*1000.		MATL1030
	FTY =FTY*1000.		MATL1040
	RETURN		MATL1050
34	FTU = FTU -1.748248E-18*TT +5.838111E-22*TT*TEMP		MATL1060
	FTY = FTY -1.308519E-18*TT +4.248255E-22*TT*TEMP		MATL1070
	GO TO 35		MATL1080
37	FTU = FTU -3.23879E-21*TT +9.924589E-25*TT*TEMP-1.702433E-28*TT		MATL1090
	1*TEMP**2 + 1.24839E-32*TT*TEMP**3		MATL1100
	GO TO 35		MATL1110
10	IF (NOUT .GT. 0) WRITE(6,15) TEMP, TMAX		MATL1120
15	FORMAT(/1X,41HMATERIAL TEMPERATURE GREATER THAN MAXIMUM/		MATL1130
	11X,F10.1,19H DEGREES REDUCED TO,F10.1,8H DEGREES//)		MATL1140
	TEMP = TMAX		MATL1150
	GO TO 20		MATL1160
25	WRITE(6,26) N		MATL1170
26	FORMAT(80H ERROR IN MATERIALS SUBROUTINE,REQUESTED DATA NOT AVAILABLE,		MATL1180
	18LE, MATERIAL NUMBER IS , 18)		MATL1190
	IND = 1		MATL1200
	RETURN		MATL1210
	END		MATL1220

	SUBROUTINE PROP1	PRP10010
C	MODES -1 MIN THRUST	PRP10020
C	MODES 0 CFN REQUIRED	PRP10030
C	MODES +1 MAX THRUST	PRP10040
	COMMON /FAILUR/ KFAIL	PRP10050
	COMMON /ERPPT/ BOMB(4),MUM,IARI(2)	PRP10060
	COMMON /EXCLUD/ PT2, TT2, PTO, CDA, ADAC, PT2PO	PRP10070
	COMMON /RJBLK/ RJ(50)	PRP10080
	EQUIVALENCE	PRP10090
	1(RJ(1),CNM),(RJ(2),ANC),(RJ(3),ANN),(RJ(4),AL),	PRP10100
	2 (RJ(6), CDB), (RJ(7), C1),	PRP10110
	3(RJ(9),PT4Y),(PJ(10),GAM),(RJ(11),A6MAX),(RJ(12),ACMAX),	PRP10120
	4 (RJ(13), A6MIN), (RJ(14), XMOMR),	PRP10130
	5(RJ(17),CDC),(PJ(18),PCMGN), (RJ(20),ALFCLD),	PRP10140
	6(RJ(21),A2A3),(PJ(22),FARLR),(RJ(23),IID),(RJ(24),BPAR),	PRP10150
	7 (RJ(26),TT4),(RJ(27),FAR),(RJ(28),PM),	PRP10160
	8 (RJ(29), WF), (RJ(30), ANC4), (RJ(31), PT2PCC),	PRP10170
	9(RJ(33),TD),(RJ(34),PD),(RJ(35),KDIA),(RJ(36),PT4I),	PRP10180
	X (RJ(37),PT4I),(RJ(38),PT42),(RJ(39),PT43),	PRP10190
	1(RJ(40),AM6),(PJ(41),AM4),(RJ(42),AM2),(RJ(43),GAM2),	PRP10200
	2 (RJ(44), GAM4), (RJ(45), P6), (RJ(47), AR2),	PRP10210
	3(RJ(48),AR4),(PJ(49),PT4),(RJ(50),WAA3)	PRP10220
C	COMMON BLOCK FOR ALTITUDE,TITLE,ID AND FUEL DECKS	PRP10230
	COMMON /ALTDC/	PRP10240
	IK1,ALT(24),SDTEMP(24),PPRESS(24),ID(8)	PRP10250
	COMMON /FUELXX/	PRP10260
	2K2,KK(15),TT2TAB(15),TFAR1(15,15),TTRS1(15,15),TTRS2(15,15),	PRP10270
	X TTRS3(15,15),	PRP10280
	3K3,KL(15),JGAMM,TT4TA(15),TFAR2(15,15),TGAM(15,15),EG(15,15),	PRP10290
	XFC(15,15),	PRP10300
	4K4,KN(15),JP, TT4TR(15),TFAR3(15,15),RTAB(15,15),FR(15,15),	PRP10310
	XFR(15,15),	PRP10320
	5NB1,AAM(24),ANC1(24),FARL(24)	PRP10330
C	COMMON BLOCK FOR INLET PERFORMANCE MAP	PRP10340
	COMMON/INLETX/	PRP10350
	6K8,KPTC(15),ALPHV(15),AAMACH(15,15),ADACC(15,15),PT3PTO(15,15),	PRP10360
	1ADDD(15,15)	PRP10370
	COMMON/RJBAT/CFN1,CFN2,A5A3,A6A3,ACA3,SFC,B11,B12,B13	PRP10380
	COMMON/TRAJX/ CFNET,CFNRQ,AMACH,ALF1,MODES,IND,FARMAX,TT4MAX,FSLR	PRP10390
	1,ICODE	PRP10400
	COMMON/EXTERN/ AR(20)	PRP10410
	EQUIVALENCE (AR(3),D3),(AR(12),A3)	PRP10420
C	OPT 1 PC MARGIN MODE = 1	PRP10430
C	OPT 2 TT4 MAX KCODE2 = 1	PRP10440
C	OPT 3 FAR MAX MODE = 2	PRP10450
C	OPT 4 CFN	PRP10460
C	TABLE 2 TEMP RISE	PRP10470
C	TABLE 3 GAMMA	PRP10480
C	TABLE 4 R	PRP10490
C	TABLE 5 BURNER SEVENTY TABLE (TEMP RISE EFF, LEAN BLOW CUT)	PRP10500
C	TABLE 6 INLET MAP (PT2PTO,ADAC,CDA)	PRP10510
	COMMON /CODEXX/II(16)	PRP10520
	EQUIVALENCE (II(1),KIND)	PRP10530
	EQUIVALENCE (II(15), NOUT)	PRP10540
	LOGICAL OPT(3)	PRP10550

LOGICAL L1,L2,L3,L4	PRP10560
DIMENSION NUMRER(6), JVER(7)	PRP10570
DATA NUMBER/'1','2','3OR4','3OR4','5','6'/	PRP10580
DATA JVER/'DTRQ','PT4','AM2','AM2*','AQAC','PMAR','CFRQ'/	PRP10590
NAMLIST /STOP/ ALF1,AMACH,BPAR,PQ, FAR,TT2, TT4,	PRP10600
1WAA3,TTQ,PTQ,AQAC,PT2PO,DTRISE,ANC,MODES, CTREQ,PT4N,PPR	PRP10610
2T41,PT2MAR,PT2POC,AM2,AM2NEW,CFNET,CFNRQ,WF,WA,J1,J2,J3,J4,J5,J6,	PRP10620
3 FARLB,PT2POA	PRP10630
4 ,AM4,AM6,GAM2,GAM4,CDA,AR2,AR4,ACA3,A5A3,P6PT6,GAM	PRP10640
5 ,CFHI,CFLD,WFHI,WFLD,L1,L2,L3,L4	PRP10650
CAMF(Q,R)=(1.+(Q-1.)/2.*R*R)	PRP10660
WFHI = 0.0	PRP10670
WFLD = 0.0	PRP10680
IND = 0	PRP10690
CALL ISEN (TO,PQ,AMACH,TT2,PTQ)	PRP10700
IF(KFAIL .GT. 0) RETURN	PRP10710
75 TTQ=TT2	PRP10720
C OBTAIN PRESS RECOVERY,AQAC AND ADDITIVE DRAG	PRP10730
CALL TLU2(ALF1,ALPHV,K8,AMACH,AAMACH,KPTC,AQACC,AQAC,IND)	PRP10740
IF(IND.NE.0) GO TO 415	PRP10750
CALL TLU22(PT3PTQ,PT2POA)	PRP10760
CALL TLU22(ADDD,CDA)	PRP10770
PT2MAR =(1.-PCMGN/100.)*PT2POA	PRP10780
PT2 = PTQ*PT2MAR	PRP10790
IF(ICODE.NE.0) GO TO 10	PRP10800
A3=.7854*Q3**2/144.	PRP10810
A2A3 = 1.	PRP10820
L2=.FALSE.	PRP10830
L3=.FALSE.	PRP10840
L4=.FALSE.	PRP10850
OPT(2)=.FALSE.	PRP10860
OPT(3)=.FALSE.	PRP10870
IF(TT4MAX.GT.0.) OPT(2) = .TRUE.	PRP10880
IF(FARMAX.GT.0.) OPT(3)=.TRUE.	PRP10890
A5A6=A5A3/A6A3	PRP10900
A6A5=1./A5A6	PRP10910
ICODE =1	PRP10920
10 L2= OPT(2)	PRP10930
L3=OPT(3)	PRP10940
L1=.TRUE.	PRP10950
IXX = 0	PRP10960
PART=GAM/2.*PQ*AMACH**2*A3	PRP10970
AQA3=AQAC*ACA3	PRP10980
WAA3=SQRT(GAM)*.7765056*PQ*AMACH/SQRT(TO)*AQAC*ACA3	PRP10990
WA=WAA3*A3	PRP11000
CA=CDA*PART*ACA3	PRP11010
RDR=XMOMR*WA*AL/32.174*AMACH*49.04*SQRT(TO)	PRP11020
DR=2.*AQA3*PART-RDR	PRP11030
	PRP11040
	PRP11050
AQA2=(AQAC*ACA3)/A2A3	PRP11060
BPAP=WAA3*(1.-AL)/A5A3*(TTQ/1000.)**2	PRP11070
CALL TLU1(BPAR,AAM,NB1,ANC1,ANC,IND)	PRP11080
IF(IND.NE.0) GO TO 410	PRP11090
CALL TLU11(FARL,FARLB)	PRP11100
IF(FARLB.LE.0.) FARLB = 0.005	

WF = .025 * 3600.*A3 * WAA3 * (1.-AL)	PRP11110
IF(MODES) 15,17,16	PRP11120
15 FAR= FARLH*FSLBO	PRP11130
WF = FAR*WA*3600.0*(1.-AL)	PRP11140
L2 = .FALSE.	PRP11150
GO TO 225	PRP11160
17 L4 = .TRUE.	PRP11170
IF(CNRQ .LE. 0.) GO TO 456	PRP11180
16 IF (OPT(3))	PRP11190
1WF =FARMAX*3600.*A3*(1-AL)*WAA3	PRP11200
IF(OPT(2))	PRP11210
1DTREQ=(TT4MAX-TT2)/ANC	PRP11220
225 PT2PD = PT2MAR	PRP11230
230 PT2PDC=PT2PDA	PRP11240
C	PRP11250
J5=0	PRP11260
J6=0	PRP11270
235 PT4I=.91*PT2PD*PD*(TT2/TO)**(GAM/(GAM-1.))	PRP11280
FAR=WF/(WA*3600.*(1.-AL))	PRP11290
240 J1=0	PRP11300
J2=0	PRP11310
245 CALL DTRGET (FAR,TT2,DTRISE,IND)	PRP11320
IF (IND.NE.0) GO TO 395	PRP11330
TT4=TT2+ANC*DTRISE	PRP11340
IF(.NOT.13 .AND. 12) GO TO 250	PRP11350
GO TO 260	PRP11360
250 IF (ABS(DTRISE-DTREQ) .LT. .5) GO TO 259	PRP11370
IF (J1.GT.50) GO TO 345	PRP11380
J1=J1+1	PRP11390
FAR=FAR*DTREQ/DTRISE	PRP11400
IF (OPT(3).AND.FAR.GT.FARMAX) FAR=FARMAX	PRP11410
GO TO 245	PRP11420
259 WF = FAR * 3600. * A3 * (1.-AL) * WAA3	PRP11430
260 CALL RGAMER (IID,0.0, TT2,GAM2,IND,AR2)	PRP11440
IF (IND.NE.0) GO TO 400	PRP11450
CALL RGAMER (IID,FAR, TT4,GAM4,IND,AR4)	PRP11460
IF (IND.NE.0) GO TO 400	PRP11470
C	PRP11480
PT4N=((1.-AL)*(1.+FAR)*WAA3*SQRT(TT4))/(A5A3*CNM*SQRT((32.2*GAM4/	PRP11490
1R4)*((2./(GAM4+1.))*((GAM4+1.)/(GAM4-1.))))	PRP11500
IF (ABS(PT4I-PT4N).LT.2.) GO TO 265	PRP11510
PT4I=PT4N	PRP11520
IF (J2.FQ.50) GO TO 350	PRP11530
J2=J2+1	PRP11540
GO TO 245	PRP11550
C	PRP11560
265 CAR=CNM*A5A3	PRP11570
PR=1./CAR	PRP11580
K=-1	PRP11590
CALL MACHNO (PR,GAM4,AM4,K,IND)	PRP11600
IF (IND.NE.0) GO TO 385	PRP11610
AM2=0.1	PRP11620
ST01=0.	PRP11630
ST02=0.	PRP11640
	PRP11650

BB1=AM4*SQRT(GAME(GAM4,AM4))	PRP11660
RP2=1.-CDR/2.	PRP11670
BR3=1.+GAM4*AM4*AM4	PRP11680
BR4=(GAM2-1.)/2.	PRP11690
PR5=(1.+FAR)*(1.-AL)*SQRT((GAM2*AR4*TT4)/(GAM4*AR2*TT2))	PRP11700
J3=0	PRP11710
270 CONTINUE	PRP11720
G22=AM2*AM2	PRP11730
AM2NEW=RR1*(1.+GAM2*G22*BB2)/(BB3*SQRT(1.+BB4*G22))/RR5	PRP11740
IF (ABS(AM2NEW-AM2)-.0001) 280,280,275	PRP11750
275 IF (J3.GT.50) GO TO 355	PRP11760
J3=J3+1	PRP11770
AA=(AM2NEW-STO1)/(AM2-STO2)	PRP11780
IF (AA.EQ.1.) GO TO 360	PRP11790
Q=AA/(AA-1.)	PRP11800
IF (Q.GE.1.) Q=.99	PRP11810
IF (Q.LE.-1.) Q=-.99	PRP11820
STO1=AM2NEW	PRP11830
STO2=AM2	PRP11840
AM2=Q*STO2+(1.-Q)*STO1	PRP11850
GO TO 270	PRP11860
C	PRP11870
C	PRP11880
280 PT2POC=PO/PTO*AMACH/AM2*SQRT(GAM*TT2/GAM2/TO)*(1.+(GAM2-1.)/2.*AM2	PRP11890
1**2)**((GAM2+1.)/2./(GAM2-1.))*AQAZ	PRP11900
K=1	PRP11910
CALL MACHND (A6A5,GAM4,AM6,K,IND)	PRP11920
IF (IND.NE.0) GO TO 385	PRP11930
IF (MODES .LT. 0) GO TO 325	PRP11940
IF(L3) GO TO 285	PRP11950
IF(L2) GO TO 290	PRP11960
IF(L1) GO TO 300	PRP11970
325 PT2PO = PT2POC	PRP11980
PEPT6=GAME(GAM4,AM6)**(-CAM4/(GAM4-1.))	PRP11990
CFINT=(A6A3/(.7*AMACH**2))*(PT4N/PO*AMN*P6PT6*(1.+GAM4*AM6**2)-1.)	PRP12000
1-2.*AQAC*ACA3	PRP12010
FC=(CFINT+2.*AQAZ)*PART	PRP12020
FN=HG-DP-DA	PRP12030
CFNET=FN/PART	PRP12040
IF(MODES.NE.0) GO TO 326	PRP12050
315 IF (ABS(CFNET-CFNRQ).LT..001) GO TO 326	PRP12060
IF(IXX.EQ.0) GO TO 327	PRP12070
316 IF(CFNET .LE. 0.005) GO TO 312	PRP12080
IF(CFNET .LT. CFNRQ) GO TO 317	PRP12090
WFHI = WF	PRP12100
CFHI = CFNET	PRP12110
IF (WFLO .GT. 0.0) GO TO 318	PRP12120
319 WF = WF*(CFNRQ/CFNET)**.84	PRP12130
320 IF(J6 .GT. 50) GO TO 375	PRP12140
IF(J6 .GT. 40) WRITE(6,STOP)	PRP12150
J6=J6+1	PRP12160
GO TO 417	PRP12170
317 CFLO = CFNET	PRP12180
WFLO = WF	PRP12190
IF(WFHI .LE. 0.0) GO TO 319	PRP12200

318	WF = WFLO +	(CFNRQ-CFLO)/(CFHI-CFLO)*(WFHI -WFLO)	PRP12210
	GO TO 320		PRP12220
326	SFC=WF/FN		PRP12230
	G22=GAMF(GAM4,AM4)		PRP12240
	T4=TT4/G22		PRP12250
	PS2=(GAMF(GAM2,AM2))*((GAM2/(1.-GAM2))*PTQ*PT2POC		PRP12260
	IF(MODES .EQ. -2) MODES = 0		PRP12270
	RJ(5)=PT2PO		PRP12280
	RJ(8)=PT2		PRP12290
	RJ(15)=AQAC		PRP12300
	RJ(16)=CDA		PRP12310
	RJ(32)=PTQ		PRP12320
	RJ(46)=TT2		PRP12330
	RETURN		PRP12340
327	IF(CFNET.LT.CFNRO) GO TO 326		PRP12350
	L1 = .FALSE.		PRP12360
	L2 = .FALSE.		PRP12370
	L3 = .FALSE.		PRP12380
	IXX = 1		PRP12390
	GO TO 316		PRP12400
285	IF(L2) GO TO 301		PRP12410
299	IF(.NOT.L1) GO TO 325		PRP12420
	IF(PT2POC .LT. PT2MAR) GO TO 305		PRP12430
	L3 = .FALSE.		PRP12440
	GO TO 300		PRP12450
301	IF(TT4 .GT. TT4MAX) GO TO 302		PRP12460
	L2 = .FALSE.		PRP12470
	GO TO 299		PRP12480
302	L3 = .FALSE.		PRP12490
	GO TO 250		PRP12500
305	L1 = .FALSE.		PRP12510
	GO TO 325		PRP12520
290	IF(.NOT.L1) GO TO 325		PRP12530
	IF(PT2POC .LT. PT2MAR) GO TO 305		PRP12540
	L2 = .FALSE.		PRP12550
	GO TO 300		PRP12560
300	IF (ABS(1.-PT2POC/PT2MAR).LE..001) GO TO 325		PRP12570
	IF(J5.GT.50) GO TO 370		PRP12580
	J5=J5+1		PRP12590
	IF(I4) GO TO 310		PRP12600
311	WF=WF*((PT2MAR/PT2POC)**2*TT4-TT2)/(TT4-TT2)		PRP12610
417	IF(WF.LE.0.) GO TO 312		PRP12620
	FAR=WF/(WAA3*A3*3600.*(1.-AL))		PRP12630
	IF(OPT(3) .AND. FAR .GT. FARMAX) FAR = FARMAX		PRP12640
313	WF = FAR*3600.*A3*(1.-AL)*WAA3		PRP12650
	GO TO 240		PRP12660
312	IF(FAR .LE. FARLB) GO TO 451		PRP12670
	FAR= FARLB		PRP12680
	GO TO 313		PRP12690
310	P6PT6=GAMF(GAM4,AM6)**(-GAM4/(GAM4-1.))		PRP12700
	CFINT=(A6A3/(.7*AMACH**2))*((PT4N/PO*ANN*P6PT6*(1.+GAM4*AM6**2)-1.))		PRP12710
	I-2.*AQAC*ACA3		PRP12720
	FC=(CFINT+2.*AQAC3)*PART		PRP12730
	FN=FC-DR-DA		PRP12740
	CFNET=FN/PART		PRP12750

CEN=CFNET	PRP12760
IF(CEN.LT. CENRQ .OR. PT2POA.GT. PT2POC) GO TO 311	PRP12770
L1 = .FALSE.	PRP12780
GO TO 315	PRP12790
345 IND=1	PRP12800
GO TO 380	PRP12810
350 IND=2	PRP12820
GO TO 380	PRP12830
355 IND=3	PRP12840
GO TO 380	PRP12850
360 IND=4	PRP12860
IF (NOUT .NE. 0) WRITE (6,520)	PRP12870
GO TO 505	PRP12880
370 IND=6	PRP12890
GO TO 380	PRP12900
375 IND=7	PRP12910
380 IF (NOUT .NE. 0) WRITE (6,525) JVER(IND)	PRP12920
GO TO 505	PRP12930
385 IND=8	PRP12940
IF (NOUT .NE. 0) WRITE (6,530)	PRP12950
GO TO 505	PRP12960
395 IDEN=NUMBER(2)	PRP12970
GO TO 435	PRP12980
400 IDEN=NUMBER(3)	PRP12990
GO TO 435	PRP13000
410 IDEN=NUMBER(5)	PRP13010
GO TO 435	PRP13020
415 IDEN=NUMBER(6)	PRP13030
435 IF (NOUT .NE. 0) WRITE (6,540) IDEN	PRP13040
IF (NOUT .NE. 0) WRITE (6,545) BOMB, IARI(MUM)	PRP13050
IF (IND.EQ.10) GO TO 440	PRP13060
IF (NOUT .NE. 0) RETURN	PRP13070
WRITE (6,550)	PRP13080
505 IF(NOUT.LE. 1) RETURN	PRP13090
WRITE (6, STOP)	PRP13100
CALL PDUMP (ALPHA,FN,5)	PRP13110
RETURN	PRP13120
440 IF (NOUT .NE. 0) WRITE (6,555)	PRP13130
GO TO 505	PRP13140
451 IF(MODES .EQ. 0) GO TO 456	PRP13150
IND = 1	PRP13160
IF (NOUT .NE. 0) WRITE (6,452)	PRP13170
452 FORMAT(49H LEAN BLOW OUT PRESSURE RECOVERY EXCEEDS CRITICAL)	PRP13180
GO TO 505	PRP13190
456 MODES = -2	PRP13200
GO TO 15	PRP13210
520 FORMAT (' IMPROPER SLOPE IN ITERATION TO FIND AM2 ')	PRP13220
525 FORMAT (' FAILURE TO CONVERGE IN PROPI IN THE LOOP FOR ',A4/)	PRP13230
530 FORMAT (' OF FAILURE IN MACHNO WHEN CALLED BY PROPI ')	PRP13240
540 FORMAT (' OAN OUT OF TABLE CONDITION EXISTS IN TABLE ',A4,' IN PROPP	PRP13250
11 '/'	PRP13260
545 FORMAT(' 1ST IND VARIABLE=',F12.5,' 2ND IND VARIABLE= ',F12.5, ' S	PRP13270
1UBTABLE =',F10.3,' SUBTABLE SIZE =',F10.3/' THE VARIABLE OUT OF R	PRP13280
2NGE IS THE ',A4,' INDEPENDENT VARIABLE'/)	PRP13290
550 FORMAT (' THE INDEPENDENT VARIABLE IS LARGER THAN THE LARGEST TAB	PRP13300

AD-A048 366

LTV AEROSPACE CORP DALLAS TEX VUGHT SYSTEMS DIV

F/G 15/7

SEATIDE ANALYSIS PROCESS. VOLUME III E. CRUISE MISSILE - CONCEP--ETC(U)

FEB 75 R K MCDONOUGH

DAAB09-72-C-0062

UNCLASSIFIED

VSD-00.1636-VOL-3E-REV-A

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1E VALUE'/)	PPR13310
555 FORMAT (' THE INDEPENDENT VARIABLE IS SMALLER THAN THE SMALLEST T	PPR13320
1BLE VALUE'/)	PPR13330
END	PPR13340

SUBROUTINE PROPRJ	PPRJ0010
COMMON /FAILUR/ KFAIL	PPRJ0020
COMMON /ADCON/ SPPWF, CON,FF(18)	PPRJ0030
COMMON /ERPR/ ROMB(4),MUM,IARI(2)	PPRJ0040
COMMON /RJITL/ TITLF(20)	PPRJ0050
COMMON/EXXRJ/ FX(48)	PPRJ0060
EQUIVALENCE	PPRJ0070
7(FX(25),C6),(EX(26),TINAFI),(EX(27),WRJ),(EX(28),XRJ),	PPRJ0080
8(FX(29),TFMPC),(EX(30),MTLRAM)	PPRJ0090
COMMON/CODEXX/ II(16)	PPRJ0100
C CODEXX EXTERNAL INTEGER ARRAY	PPRJ0110
EQUIVALENCE	PPRJ0120
1(II(1),KIND),(II(2),INLET),(II(3),ISIZE),(II(4),NOOP),	PPRJ0130
1(II(5),KSUS),(II(6),KFM),(II(7),IBSTIN),	PPRJ0140
2(II(13),IEX),(II(14),NPASS),(II(15),NOUT),(II(16),IXXA)	PPRJ0150
COMMON /SUSCAT/ TX(44)	PPRJ0160
EQUIVALENCE	PPRJ0170
7(TX(25), SUSMLT),(TX(26),SUSMWT),(TX(27),FMIN),(TX(28),DELWT),	PPRJ0180
9(TX(33), SUSLT),(TX(34),SUSWT),(TX(35),FTUS),(TX(36),FTYS),	PPRJ0190
1(TX(37), SMLT),(TX(38),SMWT),(TX(39),FMINT),(TX(40),FUSARL)	PPRJ0200
C	PPRJ0210
COMMON /LOOPXX/ LOOPRJ,CENSAV,WTSAV,WSSAV,SLSAV	PPRJ0220
C	PPRJ0230
C	PPRJ0240
COMMON /ORDAT/ CNMR,PTJ,ANNJ,GAMJNW,AFJ,TTJWEW,AJO3,STJA3,ST2A3,	PPRJ0250
1 IDREF	PPRJ0260
COMMON /RJDAT/ CFNPQ,CFN, A5A3,A6A3,ACA3,SFC,ROSTWT,RCSTLT,	PPRJ0270
1 POSTPP	PPRJ0280
COMMON /IPROP/ IND,IMIN,NEWPT,IRJOUT	PPRJ0290
COMMON /EXTERN/ AR (20)	PPRJ0300
COMMON /INDATA/ CDINL, CLALF,WTINLT	PPRJ0310
EQUIVALENCE	PPRJ0320
1(AR(1),PLLT),(AR(2),PLMASS),(AR(3),D3),(AR(4),RANGE),	PPRJ0330
2(AR(5),WTTOT),(AR(6),XLTOT),(AR(7),VL),(AR(8),VECB),	PPRJ0340
3(AR(9),DELVI),(AR(13),PAYLD)	PPRJ0350
EQUIVALENCE(AR(19),BDC),(AR(20),CFSTOR)	PPRJ0360
COMMON /TRJDTA/ POINT(10,7)	PPRJ0370
COMMON /RJPLOK/ RJ(50)	PPRJ0380
EQUIVALENCE	PPRJ0390
1(RJ(1),CNM),(RJ(2),ANC),(RJ(3),ANN),(RJ(4),AL),	PPRJ0400
2(RJ(5),PT2PO),(RJ(6),CDB),(RJ(7), C1),(RJ(8),PT2),	PPRJ0410
3(RJ(9),PT4Y),(RJ(10),GAM),(RJ(11),A6MAX),(RJ(12),ACMAX),	PPRJ0420
4(RJ(13),A6MIN),(RJ(14),XMMOMR),(RJ(15),AOAC),(RJ(16),CDA),	PPRJ0430
5(RJ(17),DELTA),(RJ(18),PCMGN),(RJ(19),AMACH),(RJ(20),ALFOLD),	PPRJ0440
6(RJ(21),A2A2),(RJ(22),FARLB),(RJ(23),IID),(RJ(24),BPAR),	PPRJ0450
7(RJ(25),ALFL),(RJ(26),TT4),(RJ(27),FAR),(RJ(28),PM),	PPRJ0460
8(RJ(29),WF),(RJ(30),ANC4),(RJ(31),PT2POC),(RJ(32),PTC),	PPRJ0470
9(RJ(33),TO),(RJ(34),PO),(RJ(35),KDIA),(RJ(36),PT4I),	PPRJ0480


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X (RJ(37),PT41 ),(RJ(38),PT42 ),(RJ(39),PT43 ), PPRJ0490
1(RJ(40),AM6 ),(RJ(41),AM4 ),(RJ(42),AM2 ),(RJ(43),GAM2 ), PPRJ0500
2(RJ(44),GAM4 ),(RJ(45),P6 ),(RJ(46),TT2 ),(RJ(47),AR2 ), PPRJ0510
3(RJ(48),AR4 ),(RJ(49),PT4 ),(RJ(50),WAA3 ) PPRJ0520
C IMIN= 1 OBTAIN MINIMUM LT/WT FOR SUSTAINER PPRJ0530
C IMIN= 0 OBTAIN LT/WT FOR SUSTAINER WT/LT GIVEN PPRJ0540
C COMMON BLOCK FOR ALTITUDE,TITLE,ID AND FUEL DECKS PPRJ0550
COMMON /ALTDC/ PPRJ0560
IK1,ALT(24),SDTEMP(24),PRESS(24),ID(8) PPRJ0570
COMMON /FUELXX/ PPRJ0580
2K2,KK(15),TT2TAB(15 ),TFAR1(15,15),TTPS1(15,15),TTRS2(15,15), PPRJ0590
X TTPS3(15,15), PPRJ0600
3K2,KL(15),JCAMM,TT4TA(15),TFAR2(15,15),TGAM(15,15),EG(15,15), PPRJ0610
XFC(15,15), PPRJ0620
4K4,KN(15),JR, TT4TB(15),TFAR3(15,15),RTAB(15,15),ER(15,15), PPRJ0630
XFR(15,15), PPRJ0640
5NR1,AAM(24),ANC1(24),FARL(24) PPRJ0650
C COMMON BLOCK FOR INLET PERFORMANCE MAP PPRJ0660
COMMON/ INLETX/ PPRJ0670
6KR,KPTC(15),ALPHV(15),AAMACH(15,15),AQACC(15,15),PT3PTO(15,15), PPRJ0680
IADDD(15,15) PPRJ0690
DIMENSION ACSTO(24),A5STO(24),A6STO(24),CFSTO(24),PTSTC(24) PPRJ0700
COMMON/PRONG/ ALFTAB,A5OLD,IACMAP,TT4MAX,ACSTO,A5STC,A6STO, PPRJ0710
1 CFSTO,PTSTO PPRJ0720
COMMON /CODERJ/ IPASS,ICALF,JCOND PPRJ0730
C JCOND FPROR INDICATOR PPRJ0740
NAMELIST /DIAG/ GAM2,AR2,GAM4,AR4,WAA3,FAR, PT2PO,TT2, PPRJ0750
1 PT4,ACA3,AM4,CFN,A5A3,TT4,BPAR,AM2,FARLB,ALF1,IND,PT4I, A5A3 PPRJ0760
IRJOUT = 1 PPRJ0770
A5OLD=2. PPRJ0780
KDIA = 0 PPRJ0790
IND = 0 PPRJ0800
XPJ=0. PPRJ0810
KWHAM=0 PPRJ0820
LOOP = 1 PPRJ0830
NOUTZ = NOUT PPRJ0840
IF(NOUT.NE.0) WRITE(6,605) NPASS PPRJ0850
6C5 FORMAT(5X5FREGIN,IX, PPRJ0860
1 8HLOOP NO. , 13, 2X6HON CFN / ) PPRJ0870
IF(NEWPT.LT.1) GO TO 100 PPRJ0880
IDREF = 0 PPRJ0890
C PPRJ0900
C DESIGN POINT DATA PPRJ0910
C PPRJ0920
ALFTAB = 200. PPRJ0930
ALFOLD = 200. PPRJ0940
A5OLD = 2. PPRJ0950
ALF1 =1. PPRJ0960
AMACH=POINT(1,2) PPRJ0970
FP =POINT(1,1) PPRJ0980
CFNRQ=0.2*(1.+ POINT(1,4)) PPRJ0990
EOSTLT=SUSLT PPRJ1000
IF(LOOPRJ.GT.0) CFNRQ=CFNSAV PPRJ1010
TT4MAX = POINT(1,7) PPRJ1020
II(16) = 0 PPRJ1030

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IF(TT4MAX-1.) 95,95,96	PPRJ1040
55 I(16) = 1	PPRJ1050
FAP = TT4MAX	PPRJ1060
56 CFSTOR = CFNRQ	PPRJ1070
AP(16) = AMACH	PPRJ1080
CALL TLU1(HP,ALT,K1,PRESS,PO,IND)	PPRJ1090
IF(IND.NE.0) GO TO 138	PPRJ1100
CALL TLU1(SDTEMP,TO)	PPRJ1110
C CERTAIN TT2,PTO	PPRJ1120
CALL ISEN(TO,PO,AMACH,TT2,PTO)	PPRJ1130
IF (KFAIL .GT. 0) RETURN	PPRJ1140
IF(TT4 .LT. TT2) GO TO 2000	PPRJ1150
NEWPT = 0	PPRJ1160
100 IF(ABS(ALFTAB -ALF1) .LT. .001) GO TO 200	PPRJ1170
ALFTAB = ALF1	PPRJ1180
C CERTAIN PRESS RECOVERY,ADAC AND ADDITIVE DRAG	PPRJ1190
CALL TLU2(ALF1,ALPHV,K8,AMACH,AAMACH,KPTC,ADACC,ACAC,IND)	PPRJ1200
IF(IND.NE.0) GO TO 2014	PPRJ1210
CALL TLU22(PT3PTO,PT2POA)	PPRJ1220
CALL TLU22(ADDD,CDA)	PPRJ1230
PT2PO = (1.-PCMGN/100.)*PT2POA	PPRJ1240
PT2 = PTO*PT2PO	PPRJ1250
IF (ABS(ALFOLD -ALF1) .LT. 1.) GO TO 200	PPRJ1260
C	PPRJ1270
C ACA3 MAP	PPRJ1280
C	PPRJ1290
C ACA3 VS CFN MAP GENERATION	PPRJ1300
C LOAD TABLE VALUES	PPRJ1310
101 ALFOLD = ALF1	PPRJ1320
JCOND = 0	PPRJ1330
KKK = 0	PPRJ1340
KCIA = 0	PPRJ1350
ACA3 = 0.05	PPRJ1360
A5A3 = .05	PPRJ1370
IACMAP = 0	PPRJ1380
DELAR = .02	PPRJ1390
CFNSTO = -50.	PPRJ1400
105 IF(KIND.EQ.42)GO TO 110	PPRJ1410
CALL RJDES	PPRJ1420
GO TO 115	PPRJ1430
110 CALL DRDES	PPRJ1440
115 IF(IND.NE.0) GO TO 900	PPRJ1450
IF(JCOND .NE. 0) GO TO 120	PPRJ1460
IF(CFN.LT. CFNSTO) GO TO 120	PPRJ1470
KKK = KKK + 1	PPRJ1480
IACMAP = KKK	PPRJ1490
PTSTO(KKK)=PT4	PPRJ1500
CFSTO(KKK)=CFN	PPRJ1510
A6STO(KKK)=A6A3	PPRJ1520
A5STO(KKK)=A5A3	PPRJ1530
ACSTO(KKK)=ACA3	PPRJ1540
CFNSTO = CFN	PPRJ1550
ACA3 = ACA3 + .1	PPRJ1560
IF(KKK.GT.15) GO TO 26	PPRJ1570
IF(ACA3 .GT. ACMAX) GO TO 120	PPRJ1580

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GO TO 105
HUNT OUT ACA3 MAX
120 KKK = 0
JCOND = 0
IF (IACMAP .LT. 1) GO TO 26
ACA3 = ACSTO(IACMAP) + DELAR
135 IF(ACA3.GT.ACMA3) GO TO 140
IF(KIND.EQ. 42) GO TO 150
CALL RJDFS
160 IF(IND.NE.0) GO TO 900
IF(JCOND .NE. 0) GO TO 140
IF(CFN.LT.CFNSTO) GO TO 140
IF(KKK.GT.15) GO TO 26
KKK = KKK + 1
IF(KKK.EQ.1) IACMAP = IACMAP + 1
ACSTO(IACMAP) = ACA3
A5STO(IACMAP) = A5A3
CFNSTO = CFN
A6STO(IACMAP) = A6A3
PTSTO(IACMAP) = PT4
CFSTO(IACMAP) = CFN
ACA3 = ACA3 + DELAR
GO TO 135
140 JCOND = 0
IF(DELAR.LE..01) GO TO 150
ACA3 = ACA3 - DELAR*.75
DELAR = .005
GO TO 135
150 CALL ORDES
GO TO 160
901 IF(III(10) .EQ. 0) GO TO 2026
TT4 = TT4 + DELT4
IF(NOUT.NE.0) WRITE(6,607) TT4
607 FORMAT( / 5X, 11HSTEP TT4 TO, F8.0 / )
IF(TT4 .GT. TT4MAX -.1) GO TO 2026
CFNRQ = CFNRQ*.9
GO TO 101
190 IF ( NOUT .EQ. 0 ) GO TO 200
619 FORMAT(///2X30HSEARCH FOR RAMJET DESIGN - NO. , I3 // )
WRITE(6,620)
620 FORMAT(//5X,10HACA3 TABLE// 15X4HACA3, 7X3HCFN, 7X4HA5A3,
1 7X4HA6A3, 6X3HPT4 )
DO 621 I=1,IACMAP
621 WRITE(6,622)ACSTO(I),CFSTO(I),A5STO(I),A6STO(I),PTSTO(I)
622 FORMAT(10X,4F10.5,F10.2)
WRITE(6,629)
629 FORMAT( /// )
IF ( NOUT .GT. 1 ) WRITE(6,191) TT4
191 FORMAT (//6H TT4= ,F10.2)
IF(NOUT.NE.0) CALL PAGE
200 IF(CFNRQ .GT. CFSTO(IACMAP)) GO TO 901
CALL TLUI(CFNRQ,CFSTO,IACMAP,ACSTO,ACA3,IND)
IF(IND.NE.0) GO TO 2026
CALL TLUI(CFNRQ,A5A3)
CALL TLUI(CFNRQ,A6A3)

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PPRJ1590
PPRJ1600
PPRJ1610
PPRJ1620
PPRJ1630
PPRJ1640
PPRJ1650
PPRJ1660
PPRJ1670
PPRJ1680
PPRJ1690
PPRJ1700
PPRJ1710
PPRJ1720
PPRJ1730
PPRJ1740
PPRJ1750
PPRJ1760
PPRJ1770
PPRJ1780
PPRJ1790
PPRJ1800
PPRJ1810
PPRJ1820
PPRJ1830
PPRJ1840
PPRJ1850
PPRJ1860
PPRJ1870
PPRJ1880
PPRJ1890
PPRJ1900
PPRJ1910
PPRJ1920
PPRJ1930
PPRJ1940
PPRJ1950
PPRJ1960
PPRJ1970
PPRJ1980
PPRJ1990
PPRJ2000
PPRJ2010
PPRJ2020
PPRJ2030
PPRJ2040
PPRJ2050
PPRJ2060
PPRJ2070
PPRJ2080
PPRJ2090
PPRJ2100
PPRJ2110
PPRJ2120
PPRJ2130

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CALL TIU11(PTSTQ,PT4I)	PPRJ2140
IF(NOUTZ.LT.0) NOUT=0	PPRJ2150
R00 = BOSTLT	PPRJ2160
B7=R00	PPRJ2170
IF(KIND.EQ.44) R00=XLTOT-SUSLT - PLIT	PPRJ2180
CALL INLETP	PPRJ2190
NOUT = NOUTZ	PPRJ2200
R00 = RZ	PPRJ2210
IF(IND.NE.0) GO TO 900	PPRJ2220
CALL CDINLT	PPRJ2230
IF(IND.NE.0) GO TO 900	PPRJ2240
KCIA = 1	PPRJ2250
MINPAR = 0	PPRJ2260
IPASS = 0	PPRJ2270
C	PPRJ2280
C BOOSTER AND SUSTAINER SIZING	PPRJ2290
C	PPRJ2300
SWTOLD = SUSWT	PPRJ2310
SLTOLD = SUSLT	PPRJ2320
205 IMIN = 0	PPRJ2330
NSIZES = 0	PPRJ2340
IF(IFX.EQ.1) GO TO 207	PPRJ2350
WPJ = 0.	PPRJ2360
206 PAYLD = WTINLT + PLMASS + SUSWT + WRJ	PPRJ2370
NSIZES = NSIZES+1	PPRJ2380
IF(NSIZES.GT.30) GO TO 33	PPRJ2390
IF((NOUT.NE.0) .AND. (NSIZES.GT.1)) CALL PAGE	PPRJ2400
IF(NOUT.NE.0) WRITE(6,609) NPASS, NSIZES	PPRJ2410
609 FORMAT(/ 5X, 8HLOOP NO. , 13, 2X6HON CFN /	PPRJ2420
1 5X, 8HLOOP NO. , 13, 2X9HON WEIGHT /)	PPRJ2430
608 CONTINUE	PPRJ2440
IF(KIND.EQ.44) GO TO 211	PPRJ2450
IF(ARS(A5OLD/A5A3 -1.0).LT. .1)GO TO 230	PPRJ2460
IF(IEX.EQ.1 .AND. IPASS.GT.0) GO TO 230	PPRJ2470
IF((NOUT.NE.0) WRITE(6,3101)	PPRJ2480
2101 FORMAT(/ 2X, 26HRECOMPUTE BOOSTER PARTIALS)	PPRJ2490
IF((NOUT.NE.0) .AND. (IEX.NE.1)) WRITE(6,3102) A5A3, A5OLD	PPRJ2500
3102 FORMAT(15X,6HA5A3 =, F10.4/ 15X,6HA5OLD=,F10.4)	PPRJ2510
NBOU=1	PPRJ2520
IF(NOUT.NE.0) WRITE(6,617) NBOU	PPRJ2530
617 FORMAT(// 2X,26HBOOSTER PARTIAL - STEP NO. , 13)	PPRJ2540
CALL BOOST(DELVI,PAYLD, A6A3,A5A3,0,BOSTPR,BOSTWT,BOSTLT,IND,CON)	PPRJ2550
IF(IND.NE.0) GO TO 28	PPRJ2560
PAYDEL = PAYLD +100.	PPRJ2570
NBOU=2	PPRJ2580
IF(NOUT.NE.0) WRITE(6,617) NBOU	PPRJ2590
CALL BOOST(DELVI,PAYDEL,A6A3,A5A3,0,PARPR,PARWT,PARLT,IND,XCX)	PPRJ2600
IF(IND.NE.0) GO TO 28	PPRJ2610
PARLOR = PARLT	PPRJ2620
PARWDR = PARWT	PPRJ2630
A5OLD = A5A3	PPRJ2640
PARWT = (PARWT-BOSTWT) /100.	PPRJ2650
PARLT = (PARLT-BOSTLT) /100.	PPRJ2660
PARPR = (PARPR-BOSTPR) /100.	PPRJ2670
PLOLD = PAYLD	PPRJ2680

IF(NOUT.NE.0) WRITE(6,615) PARWT, PARLT, PARPR	PPRJ2690
615 FORMAT(// 2X,17HCOMPUTED PARTIALS / 12X8HWEIGHT -,F10.4 /	PPRJ2700
1 12X8HLENGTH -, F10.4 / 12X8HWPROP -, F10.4)	PPRJ2710
IF(NOUT.NE.0) CALL PAGE	PPRJ2720
IF (KWFAM .GT. 0) GO TO 235	PPRJ2730
KWHAM=1	PPRJ2740
XACTL = SUSLT * (SUSWT+100.) / SUSWT	PPRJ2750
XAVAIL = XLTOT - PLLT - PARLOR	PPRJ2760
SLOLD = XACTL	PPRJ2770
DFLOLD = XAVAIL - XACTL	PPRJ2780
XACTW = SUSWT + 100.	PPRJ2790
XAVAIW = WTTOT - PARWOR - WTINLT - WRJ - PLMASS	PPRJ2800
SWOLD = XACTW	PPRJ2810
DEWOLD = XAVAIW - XACTW	PPRJ2820
GO TO 235	PPRJ2830
230 PAYDEL = PAYLD - PLOLD	PPRJ2840
BOSTWT = BOSTWT+ PAYDEL*PARWT	PPRJ2850
BOSTLT = BOSTLT+ PAYDEL*PARLT	PPRJ2860
BOSTPR = BOSTPR+ PAYDEL*PARPR	PPRJ2870
PLOLD = PAYLD	PPRJ2880
235 IF(TEX .EQ.1) GO TO 236	PPRJ2890
CLT = BOSTLT	PPRJ2900
BOO = BOSTLT	PPRJ2910
IF (NOUT .EQ. 0) GO TO 236	PPRJ2920
WRITE(6,3111) BOSTWT, BOSTLT, BOSTPR	PPRJ2930
3111 FORMAT(/ 5X, 28HBOOSTER SIZED USING PARTIALS /	PPRJ2940
1 15X,8HWEIGHT = , F10.1 / 15X,8HLENGTH = , F10.1 /	PPRJ2950
2 15X,8HPROP.WT= , F10.1)	PPRJ2960
236 IF(ISIZE .EQ.2) GO TO 260	PPRJ2970
C LT INPUT	PPRJ2980
ACTL = SUSLT	PPRJ2990
AVAIL = XLTOT - PLLT - BOSTLT	PPRJ3000
C TEST FOR CONVERGENCE ON SUSLT	PPRJ3010
DFLNEW = AVAIL - ACTL	PPRJ3020
SINFW = SUSLT	PPRJ3030
EPLT = .25	PPRJ3040
C COMPUTE NEW SUST. LT. SO THAT AVAIL = ACTL	PPRJ3050
SUSLX=SLOLD-DELOLD*(SLNEW-SLOLD)/(DFLNEW-DELOLD)	PPRJ3060
237 FORMAT(5X9HWT. ITER. ,15, 10X5F10.2)	PPRJ3070
DUMSL = ABS (SUSLT - SUSLX)	PPRJ3080
IF (DUMSL .LE. EPLT) GO TO 2240	PPRJ3090
SUSLT = SUSLX	PPRJ3100
SLOLD = SINFW	PPRJ3110
DFLOLD = DFLNEW	PPRJ3120
5262 CONTINUE	PPRJ3130
IF(KIND .EQ. 42) GO TO 261	PPRJ3140
IF((KIND.EQ.44) .AND. (NOUTZ.LE.0)) NOUT = 0	PPRJ3150
CALL SUSMAS	PPRJ3160
NCUT=NOUTZ	PPRJ3170
IF (KFAIL .GT. C) RETURN	PPRJ3180
262 IF (IND .NE. 0) GO TO 31	PPRJ3190
IF(SUSWT.LE. SUSMWT) GO TO 31	PPRJ3200
IMIN = -1	PPRJ3210
MINPAR = 0	PPRJ3220
IF(KIND.EQ.44) GO TO 2241	PPRJ3230

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      CALL INLETP
      IF ( INC .NE. 0 ) GO TO 900
      GO TO 206
2240 CONTINUE
C      TO HERE IF CONVERGED
      SLOLD = SLNEW
      DELOLD = DELNEW
      WTOLD = WTINLT
      IF(NOUT7.LT.0) NOUT=0
      CALL INLETP
      NOUT = NOUTZ
      WTNEW = WTINLT
C      TEST ON INLET WT CHANGE
      DELW = WTOLD - WTNEW
      EPIN = 1.
      IF ( ABS(DELW) .LE. EPIN ) GO TO 2241
      IF(LOOP .GT. 2 ) GO TO 2241
      LOOP = LOOP + 1
      GO TO 206
2241 CONTINUE
C      TO HERE IF CONV ON INLET WT
      LOOP = 1
      IF ( NOUT .EQ. 0 ) GO TO 2242
C      CALL SUSMAS AND INLETP FOR PRINT
      BZ=B00
      IF(KIND.EQ.44) B00=XRJ
      CALL INLETP
      B00 = BZ
      CALL SUSMAS
2242 CONTINUE
      CALL CDINLT
      IF ( INC .NE. 0 ) GO TO 900
      SLTOLD = SUSLT
      GO TO 299
261 CALL SDUCER
      IF ( KFAIL .GT. 0 ) RETURN
      GO TO 262
207 CALL EXRAM
      IF ( KFAIL .GT. 0 ) RETURN
      IF(NOUT.NE.0) CALL PAGE
      SUSLT=XLTOT-PLLT-XRJ
      SUSWT=WTTOT-WTINLT-PLMASS-WRJ
      CLT = XRJ
      GO TO 206
211 BOSTWT = 0.
      BOSTLT = 0.0
      IF( ISIZF.EQ.2) GO TO 5252
      GO TO 5262
C
C      260 WT      INPUT
260 CONTINUE
      ACTW = SUSWT
      AVAIW = WTTOT - BOSTWT - WTINLT - WRJ - PLMASS
      DELSW = AVAIW - ACTW
      DEWNEW = DELSW

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PPRJ3240
PPRJ3250
PPRJ3260
PPRJ3270
PPRJ3280
PPRJ3290
PPRJ3300
PPRJ3310
PPRJ3320
PPRJ3330
PPRJ3340
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PPRJ3750
PPRJ3760
PPRJ3770
PPRJ3780

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      SWNEW = SUSWT
C     TEST FOR CONVERGENCE
      EPSW = 1.
      SUSWX = SWOLD-DEWOLD*(SWNEW-SWOLD)/(DEWNEW-DEWOLD)
      DUMSW = ABS ( SUSWX - SUSWT )
      IF ( DUMSW .LE. EPSW ) GO TO 2252
      SUSWT = SUSWX
C     LOOP ON SUSWT
      SWOLD=SWNEW
      DEWOLD = DEWNEW
      SWTOLD = SUSWT
5252  CONTINUE
      IF( (KIND.EQ.44) .AND. (NOUTZ.LE.0) ) NOUT = 0
      IF(KIND .EQ. 42) GO TO 251
      CALL SUSMAS
      NOUT = NOUTZ
      IF ( KFAIL .GT. C ) RETURN
252  IF ( IND .NE. 0 ) GO TO 31
      IF(SUSLT.LE. SUSMLT) GO TO 31
      IMIN = -1
      IF(KIND.EQ.44) GO TO 2252
      CALL INLETP
      NOUT = NOUTZ
      IF ( IND .NE. 0 ) GO TO 900
      GO TO 206
2252  CONTINUE
      SWOLD=SWNEW
      DEWOLD=DEWNEW
      WTOLD = WTINLT
      IF ( NOUTZ .LT. C ) NOUT = 0
      RZ=B00
      IF(KIND.EQ.44) B00=XRJ
      CALL INLETP
      B00 = RZ
      NOUT = NOUTZ
      WTNEW = WTINLT
C     TEST ON INLET WT CHANGE
      DELW=WTOLD-WTNEW
      EPIN=1.
      IF( ABS(DELW) .LE. EPIN ) GO TO 2254
      IF(LOOP.GT.2) GO TO 2254
      LOOP = LOOP + 1
      GO TO 206
2254  CONTINUE
      LOOP = 1
      IF ( NOUT .EQ. 0 ) GO TO 2253
C     RUN THROUGH SUSMAS AND INLETP FOR PRINT
      RZ=B00
      IF(KIND.EQ.44) B00=XRJ
      CALL INLETP
      B00 = RZ
      CALL SUSMAS
2253  CONTINUE
      CALL CDINLT
      IF ( INC .NE. 0 ) GO TO 900

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PPRJ3790
PPRJ3800
PPRJ3810
PPRJ3820
PPRJ3830
PPRJ3840
PPRJ3850
PPRJ3860
PPRJ3870
PPRJ3880
PPRJ3890
PPRJ3900
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PPRJ3920
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PPRJ3940
PPRJ3950
PPRJ3960
PPRJ3970
PPRJ3980
PPRJ3990
PPRJ4000
PPRJ4010
PPRJ4020
PPRJ4030
PPRJ4040
PPRJ4050
PPRJ4060
PPRJ4070
PPRJ4080
PPRJ4090
PPRJ4100
PPRJ4110
PPRJ4120
PPRJ4130
PPRJ4140
PPRJ4150
PPRJ4160
PPRJ4170
PPRJ4180
PPRJ4190
PPRJ4200
PPRJ4210
PPRJ4220
PPRJ4230
PPRJ4240
PPRJ4250
PPRJ4260
PPRJ4270
PPRJ4280
PPRJ4290
PPRJ4300
PPRJ4310
PPRJ4320
PPRJ4330

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MINPAR = 0
GO TO 299
251 CALL SDUCER
   IF ( KFAIL .GT. 0 ) RETURN
   GO TO 252
C
C   SIZE ENGINE
C
259 J = 1
   CFNLO = 0.
   CFNHI = 0.
   SLTOLD = SUSLT
   SWTOLD = SUSWT
301 IF (KIND .EQ. 42) GO TO 302
   CALL RJDES
   IF (IND.NF.0) GO TO 900
   GO TO 201
302 CALL DRDES
   IF (INC.NF.0) GO TO 900
201 TCEN = CFN
   IF (ABS(CFN-CFNRO)-.0003) 240,240,210
210 IF (J-30) 411,411,2010
411 J = J + 1
   IF (CFN .LT. CFNRQ) GO TO 300
   CFNHI = CFN
   ACA3 = ACA3
   IF (CFNLO .GT. .001) GO TO 310
   ACA3 = ACA3 -.02
   GO TO 301
300 IF (ACA3.GE.ACMA3) GO TO 2026
   CFNLO = CFN
   ACLO = ACA3
   IF (CFNHI .GT. .001) GO TO 310
   ACA3 = ACA3 +0.02
311 IF (ACA3.GT. ACMA3) ACA3 = ACMA3
   GO TO 301
210 ACA3 = ACLO + (CFNRQ-CFNLO) / (CFNHI-CFNLO) * (ACHI-ACLO)
   GO TO 311
241 BOO = XRJ
   GO TO 239
240 IF (IEX .EQ. 1) GO TO 241
   BOO = BOSTLT
   GO TO 239
21 IF (MINPAR .EQ. 1) GO TO 35
   IF (ISIZE -2) 42,41,35
41 SUSWT = SUSMWT
   MINPAR = 1
   GO TO 206
42 SUSLT = SUSMLT
   MINPAR = 1
   GO TO 206
239 SFC = C1 *ACA3 /CFN *AOAC
   IF (FAR.LE.FARLB) GO TO 2028
   RETURN
C   ERROR OUTPUT

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PPRJ4340
PPRJ4350
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PPRJ4370
PPRJ4380
PPRJ4390
PPRJ4400
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PPRJ4820
PPRJ4830
PPRJ4840
PPRJ4850
PPRJ4860
PPRJ4870
PPRJ4880

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C		PPRJ4890
2000	IF (NOUT .EQ. 0) GO TO 900	PPRJ4900
	WRITE (6,1015) TITLE	PPRJ4910
1015	FORMAT(20X35H ERROR IN PROPRJ ENCOUNTERED /10X20A4)	PPRJ4920
	WRITE(6,2001)TT2	PPRJ4930
2001	FORMAT(/10X,32HTT4 IS LESS THAN OR EQUAL TO TT2//10X,4HTT2=,F8.2)	PPRJ4940
	GO TO 900	PPRJ4950
2010	IF (NOUT .EQ. 0) GO TO 900	PPRJ4960
	WRITE (6,1015) TITLE	PPRJ4970
	WRITE(6,2011)CFN,CFNRQ	PPRJ4980
2011	FORMAT(/10X,26HFAILURE TO CONVERGE ON CFN//10X,4HCFN=,F7.4,4X,	PPRJ4990
	X6PCFNRQ=,F7.4)	PPRJ5000
	GO TO 900	PPRJ5010
2014	IF (NOUT .EQ. 0) GO TO 900	PPRJ5020
	WRITE (6, 1015) TITLE	PPRJ5030
	WRITE(6,2015) AMACH, ALF1	PPRJ5040
2015	FORMAT(/10X,34HFAILURE TRYING TO READ INLET MAP /	PPRJ5050
	110X, 7HAMACH = ,F10.5, 8H ALF1 = ,F10.5)	PPRJ5060
510	IF (NOUT .EQ. 0) GO TO 900	PPRJ5070
	WRITE (6, 545) BOMB, IARI(MUM)	PPRJ5080
545	FORMAT (' 1ST IND VARIABLE= ',E12.5, ' 2ND IND VARIABLE= ',E12.5, ' S	PPRJ5090
	URTABLE = ',F10.3, ' SURTABLE SIZE = ',F10.3/' THE VARIABLE OUT OF R	PPRJ5100
	2NGE IS THE ',A4, ' INDEPENDENT VARIABLE'//)	PPRJ5110
	GO TO 900	PPRJ5120
2026	IF (NOUT .EQ. 0) GO TO 900	PPRJ5130
	WRITE (6, 1015) TITLE	PPRJ5140
	WRITE(6,2027) ACSTO(1),CFSTO(1),ACSTC(IACMAP),CFSTO(IACMAP),CFNRQ	PPRJ5150
2027	FORMAT(/10X,31HUNABLE TO FIND CFN MIN ACA3 IS ,F10.5,11H MIN CFN I	PPRJ5160
	IS ,F10.5,12H MAX ACA3 IS ,F10.5,11H MAX CFN IS ,F10.5, 6HCFNRQ ,	PPRJ5170
	2F10.5)	PPRJ5180
	GO TO 900	PPRJ5190
38	IF (NOUT .NE. 0) WRITE (6, 39)	PPRJ5200
29	FORMAT(45H EXCESSIVE ITERATIONS IN INTERNAL RAMJET LOOP)	PPRJ5210
	GO TO 900	PPRJ5220
2028	IF (NOUT .EQ. 0) GO TO 900	PPRJ5230
	WRITE (6, 1015) TITLE	PPRJ5240
	WRITE(6,2029) FAR,FARLB	PPRJ5250
2029	FORMAT(/10X,35HFAR IS EQUAL TO OR LESS THAN FARLB//10X,4HFAR=,	PPRJ5260
	XF7.4,4X,6HFARLB=,F7.4)	PPRJ5270
900	IND = 1	PPRJ5280
	IF (NOUT .NE. 0) WRITE (6,27) RJ	PPRJ5290
27	FORMAT(4F20.7)	PPRJ5300
	CALL PJWT	PPRJ5310
	RETURN	PPRJ5320
28	IF (NOUT .NE. 0) WRITE (6, 29)	PPRJ5330
29	FORMAT(38H ERROR TRYING TO GENERATE BOOSTER DATA)	PPRJ5340
	RETURN	PPRJ5350
33	IF (NOUT .NE. 0) WRITE (6, 34)	PPRJ5360
34	FORMAT(63H EXCESSIVE ITERATIONS TRYING TO DETERMINE BOOST /SUSTAIN	PPRJ5370
	1 SPLIT)	PPRJ5380
	RETURN	PPRJ5390
26	IF (NOUT .NE. 0) WRITE(6,47)IACMAP,KKK,JCOND,ACMAX,CFNSTC,CFN	PPRJ5400
47	FORMAT(42H IRRECONCILABLE ERROR IN AC MAP GENERATION /314,3F15.5)	PPRJ5410
	IND = 1	PPRJ5420
	GO TO 150	PPRJ5430

35	IF (NCUT .NE. 0) WRITE(6,36)PLMASS,PLLT,BOSTLT,BCSTWT,SUSMLT,	PPRJ5440
1	SUSMWT	PPRJ5450
36	FORMAT(53H PAYLOAD AND BOOSTER PREEMPT EXCESSIVE LENGTH/WEIGHT	/PPRJ5460
	119H DESIGN TERMINATED ,6F12.4)	PPRJ5470
	RETURN	PPRJ5480
138	IF (NCUT .NE. 0) WRITE(6, 139) HP	PPRJ5490
139	FORMAT(2X,42HERROR TRYING TO OBTAIN ATTITUDE DATA,ALT = ,F8.1)	PPRJ5500
	RETURN	PPRJ5510
2016	IF (NCUT .EQ. 0) RETURN	PPRJ5520
	WRITE (6, 1015) TITLE	PPRJ5530
	WRITE(6,2017)	PPRJ5540
2017	FORMAT(40H ERROR TRYING TO GENERATE SUSTAINER DATA ///)	PPRJ5550
	RETURN	PPRJ5560
	END	PPRJ5570

	SUBROUTINE SUSMAS				SMAS0010
C	PGM=NUK.CM-CGSM	GM/KM	FIV-EBCD	7/11/73	SMAS0020
	COMMON /COMVLS/ COM(51)				SMAS0030
	EQUIVALENCE (COM(1), WTANK),				SMAS0040
	1 (COM(2),VFXTN),				SMAS0050
	2 (COM(3),VREQX),				SMAS0060
	3 (COM(4),GGWX),				SMAS0070
	4 (COM(5),HPPUMP),				SMAS0080
	6 (COM(6),WTFUEL),				SMAS0090
	7 (COM(12),KFMX),				SMAS0100
	8 (COM(13),MATTKX)				SMAS0110
	COMMON /FAILUR/ KFAIL				SMAS0120
C	VERSION 2				SMAS0130
	COMMON /MATTP/ IR(3)				SMAS0140
	COMMON /FRPRT/ POMR(4),MUM,IARI(2)				SMAS0150
	COMMON /EXTERN/ AR (20)				SMAS0160
	EQUIVALENCE (AR(2),D3)				SMAS0170
	DIMENSION WT(15),Z(15),ZW(15),XII(15)				SMAS0180
	EQUIVALENCE (WT(1),FITNGS),(WT(6),EXINWT)				SMAS0190
	COMMON /FMPT/ HP,AMACH,ALF1,FARD				SMAS0200
	COMMON /RJDAT/ CFNRQ,CFNET,A5A3,A6A3,ACA3,SFC,BOSTWT,BOSTLT,				SMAS0210
	1 BOSTPR				SMAS0220
	COMMON/COLD/PO, C2, A3, CONS, PTO, PTR, TO, TT2				SMAS0230
	COMMON/INLETX/				SMAS0240
	6KB,KPTC(15),ALPHV(15),AAMACH(15,15),AOACC(15,15),PT3PTO(15,15),				SMAS0250
	1ACDD(15,15)				SMAS0260
	COMMON /AL TDD/				SMAS0270
	1K1,ALT(24),SDTFMP(24),PRESS(24),ID(8)				SMAS0280
	COMMON /PAKFR/ PK(48)				SMAS0290
	EQUIVALENCE				SMAS0300
	1 (PK(3),X2),(PK(4),X1),				SMAS0310
	2(PK(5),PB),(PK(6),VOLX),(PK(7),GGW),(PK(8),GGFW),				SMAS0320
	4(PK(9),ALINE),(PK(10),PNF),(PK(11),STKFS),				SMAS0330
	X(PK(29),WTATH),(PK(30),SSAFS),(PK(31),R),(PK(32),WCSTB),				SMAS0340
	X(PK(33),STKFC),(PK(34),VFMN),(PK(35),TFD),(PK(36),VOL1),				SMAS0350
	X(PK(40),DFLEXI),				SMAS0360
	X(PK(41),FXMINW),(PK(42),DELB),(PK(43),DELTK),(PK(44),BLADD),				SMAS0370
	2(PK(45),VREQ),(PK(47),SHFLL),(PK(48),XCAR)				SMAS0380

	COMMON/CODEXX/ II(16)	SMAS0390
C	CODEXX EXTERNAL INTEGER ARRAY	SMAS0400
	EQUIVALENCE	SMAS0410
	1(II(3), ISIZE),(II(6),KFM),(II(14),NPASS)	SMAS0420
	COMMON /IPROP/ IND,IMIN,NEWPT,IRJOUT	SMAS0430
	COMMON /SUSDAT/ TX(44)	SMAS0440
	EQUIVALENCE	SMAS0450
	1(TX(1), FXIN),(TX(2),DRHOF),(TX(3),EDR),(TX(4),FEXP),	SMAS0460
	2(TX(5),GGMF),(TX(6),PIDF),(TX(7),PNS),(TX(8),REGD),	SMAS0470
	3(TX(9),RHOB),(TX(10),RHOF),(TX(11),TFUL),(TX(12),RU),	SMAS0480
	4(TX(13), SKTWT),(TX(14),TBLAD),(TX(15),TNGG),(TX(16),TSUS),	SMAS0490
	5(TX(17), ULLG),(TX(18),TCASEC),(TX(19),TMAX),(TX(20),PCC),	SMAS0500
	6(TX(21), WDFMAX),(TX(22),XFMB),(TX(23),WFC),(TX(24),WFMB),	SMAS0510
	7(TX(25), SUSMLT),(TX(26),SUSMWT),(TX(27),WCPT),(TX(28),DELWT),	SMAS0520
	8(TX(29), SWTFS),(TX(30),DFLF),(TX(31),SWTOLD),(TX(32),SLTOLD),	SMAS0530
	9(TX(33), SUSLT),(TX(34),SUSWT),(TX(35),FSU2),(TX(36),FSY2),	SMAS0540
	1(TX(37), SMLT),(TX(38),SMWT),(TX(39),FDAJ),(TX(40),FUSABL),	SMAS0550
	2(TX(41), RHO),(TX(42),RHOINS),(TX(43),MATTK),(TX(44),MATPB)	SMAS0560
C	FXIN EXTERNAL INSULATION THICKNESS	SMAS0570
C	DRHOF BULK DENSITY CHANGE FOR FUEL PER DEG F	SMAS0580
C	EDR MAJOR/MINOR AXIS TANK + N2 BOTTLE DCME	SMAS0590
C	FEXP EXPULSION EFFICIENCY E.G. .97	SMAS0600
C	GGMF SGG MASS FRACTION KFM = 3 E.G. .1	SMAS0610
C	PIDF INJECTOR PRESSURE DROP FRACTION	SMAS0620
C	PNS N2 PRESSURE KFM = 2 PSIA	SMAS0630
C	REGD FUEL CONTROLLER PRESSURE DROP PSIA	SMAS0640
C	RHOB BLADDER DENSITY LB/IN3	SMAS0650
C	RHOF FUEL DENSITY LB/IN3	SMAS0660
C	TFUEL MAXIMUM FUEL TEMP AT RAMJET IGNITION	SMAS0670
C	RU GAS CONSTANT FT/DEG	SMAS0680
C	RHOINS EXTERNAL INSULATION DENSITY	SMAS0690
C	TBLAD BLADDER THICKNESS IN	SMAS0700
C	TNGG GAS OUTLET TEMP DEG R	SMAS0710
C	TSUS MAXIMUM SUSTAINER TIME SEC	SMAS0720
C	ULLG ULLAGE REQUIRED E.G. .05	SMAS0730
C	TCASEC MINIMUM TANK THICKNESS	SMAS0740
C	TMAX CASE DESIGN TEMP	SMAS0750
C	XFMB LENGTH FUEL MANAGEMENT BAY	SMAS0760
C	FSU2 ULTIMATE TENSILE SAFETY FACTOR E.G. 1.25	SMAS0770
C	FYU2 YIELD TENSILE SAFETY FACTOR E.G. 1.15	SMAS0780
	DATA GAMN2,ZP,ZO,PY /1.4C1,1.0,1.03,3.14159 /	SMAS0790
	XIISUS = 0.0	SMAS0800
	XIIMT = 0.0	SMAS0810
	IF (IMIN) 103,700,701	SMAS0820
701	ACA3 = 0.4	SMAS0830
	CALL TLU1(HP,ALT,K1,PRESS,PO,IND)	SMAS0840
	IF (IND.NE.0) GO TO 38	SMAS0850
	CALL TLU11(SDTEMP,TO)	SMAS0860
	CALL ISEN(TO,PO,AMACH,TT2,PTO)	SMAS0870
	IF (KFAIL .GT. 0) RETURN	SMAS0880
	CALL TLU2(ALF1,ALPHV,K8,AMACH,AAMACH,KPTC,ADACC,ADAC,IND)	SMAS0890
	IF(IND.NE.0) GO TO 2014	SMAS0900
	CALL TLU22(PT3PTC,PTR)	SMAS0910
	PCC = PTO*PTR/144.	SMAS0920
	C2=0.918774 *PO*AMACH/SQRT(TO)	SMAS0930

	A3= D3**2/4.* PY/144.	SMAS0940
	CONS =A3*C2*AOAC*FARD	SMAS0950
700	WDFMAX=CONS*ACA3	SMAS0960
	DFLINE = 0.2736*SQRT(WDFMAX) + .04	SMAS0970
	ALINE = DFLINE **2/4.*PY	SMAS0980
	WTLINE = DFLINE*0.0178	SMAS0990
	IF (IMIN .LT. 1) GO TO 103	SMAS1000
	IF (PCC .LT. 1. .OR. PCC .GT. 500.) PCC = 500.	SMAS1010
	CALL MATLS(MATTK,TMAX,RHO,FTU,FTY,IND)	SMAS1020
	IF (IND .NE. 0) GO TO 35	SMAS1030
	SCLDF = D3-2.*EXIN	SMAS1040
	R = SCLDF/2.	SMAS1050
	SHELL=SCLDF*PY*TCASEC*RHC+D3*PY*EXIN*RHOINS +WTLINE	SMAS1060
C	MINIMUM LENGTH TANK	SMAS1070
	SMLT =SCLDF/EDR	SMAS1080
	DELEXI = D3*PY*EXIN*RHOINS	SMAS1090
C	EXTERNAL INSULATION WEIGHT	SMAS1100
	EXMINW = DELEXI*SMLT	SMAS1110
	PFS = (PIDF+1.)*PCC	SMAS1120
C	SIZE TANK	SMAS1130
C	FUEL TANK CYLINDRICAL WITH OBLATE SPHEROID ENDS	SMAS1140
	PNF=REGD+PFS	SMAS1150
	IF(KFM.EQ.4) GO TO 105	SMAS1160
	STKFL=FSU2*PFS*SCLDF/(FTU*2.)	SMAS1170
	STKFY=FSY2*PFS*SCLDF/(FTY*2.)	SMAS1180
	STKP=AMAX1(STKFU,STKEY)	SMAS1190
	TCPRFS=STKP	SMAS1200
C	CYLINDER THICKNESS	SMAS1210
	STKFC=AMAX1(STKP,TCASEC)	SMAS1220
	STKFY=FSY2*PFS*.5*EDR/FTY *.5 *SCLDF	SMAS1230
	STKFU=FSU2*PFS*.5*EDR/FTU *.5 *SCLDF	SMAS1240
	STKDP=AMAX1(STKFU,STKEY)	SMAS1250
C	DOMES THICKNESS	SMAS1260
	STKFS=AMAX1(STKDP,TCASEC)	SMAS1270
106	SEF = (1.-1./(EDR*EDR)) **.5	SMAS1280
	SSAFS=(PY*SCLDF**2)/2.+(PY*SCLDF**2)/(4.*EDR**2*SEF))*ALOG((1.	SMAS1290
	1+SEF)/(1.-SEF))	SMAS1300
	SWTFS=STKFS*SSAFS*RHO	SMAS1310
	FITNGS = SWTFS*0.25	SMAS1320
	RR = SCLDF/2.- STKFC	SMAS1330
C	SKIRT/STIFFNER WEIGHT	SMAS1340
	WCSTB = 2.*RHO*(44.1*(R*STKFC)**1.5 + 2.75*R*R*STKFC)	SMAS1350
	WTATH = PY*SCLDF*STKFC*RHO*SMLT	SMAS1360
	SKTWT = WCSTB + WTATH	SMAS1370
	VFMN =PY*(SCLDF-2.*(TBLAD+STKFS))**3/(6.*EDR)	SMAS1380
	FDAJ =(RHO*-DRHO*(TFUL-75.))*(1.-ULLG)	SMAS1390
	WCPT = VFMN*FDAJ*EEXP	SMAS1400
	TFD= VFMN*FDAJ*(1.-EEXP)	SMAS1410
	BLADD = SSAFS*TBLAD *RHO	SMAS1420
C	MINIMUM WT TANK	SMAS1430
	SMWT=SWTFS +WCSTB +WTATH +BLADD +WCPT + EXMINW +TFD + FITNGS	SMAS1440
C	MINIMUM FUEL AVAILABLE	SMAS1450
C	FUEL /INCH OF CYLINDER	SMAS1460
	VOLI =.7854*(SCLDF-2.*(TBLAD+STKFC))**2	SMAS1470
	DELF= VOLI*FDAJ	SMAS1480

C	LP/INCH OF CYLINDER	SMAS1490
	DELB = PY*SCLDF*TRLAD*RHO	SMAS1500
	DELT = PY*SCLDF*STKFC*RHO + WTLINE	SMAS1510
	DELWT = DELT + DELB + DELF + DELEXI	SMAS1520
C	SIZE FUEL CONTROL SYSTEM	SMAS1530
103	WFC = 10. + .667*WDFMAX	SMAS1540
	GO TO (104, 450, 470, 480), KFM	SMAS1550
105	STKFC = TCASEC	SMAS1560
	STKFS = TCASEC	SMAS1570
	GO TO 106	SMAS1580
C	N2 PRESSURE BOTTLE CALCULATIONS	SMAS1590
104	IF (IMIN .EQ. 0 .OR. NPASS .GT. 0) GO TO 42	SMAS1600
	XFMR = 10.	SMAS1610
	XFOLD = 10.	SMAS1620
	SUSMLT = SMLT + XFMR	SMAS1630
	TN = 530.	SMAS1640
	SUSMWT = SMWT + 50.	SMAS1650
	IF (ISIZE .EQ. 1) GO TO 40	SMAS1660
	WTF = SUSWT - SUSMWT	SMAS1670
	XCYL = WTF/DELWT	SMAS1680
	GO TO 41	SMAS1690
40	XCYL = SUSLT - SUSMLT	SMAS1700
41	IF (XCYL .LT. 0) XCYL = 0.	SMAS1710
42	K = 0	SMAS1720
52	K = K + 1	SMAS1730
	IF (K .GT. 30) GO TO 48	SMAS1740
	VREQ = VFMN + VOLI * XCYL	SMAS1750
	WNR = (1. + (GAMN2 - 1.) * ZP) / (1. - (PNF * ZO) / (PNS * ZP))	SMAS1760
	GGFW = WNR * PNF / (ZP * RU * TN) / 12. * VREQ	SMAS1770
	GO TO 780	SMAS1780
C	GAS GENERATOR WEIGHT CALCULATIONS	SMAS1790
C	LIQUID GAS GENERATOR	SMAS1800
450	CONTINUE	SMAS1810
	VDOTB = WDFMAX / RHO	SMAS1820
	GGPV = 1.1 * VDOTB * TSUS * PNF / 12.	SMAS1830
	GGFW = GGPV / (RU * TNGG)	SMAS1840
	IF (GGFW .GT. 0.5) GO TO 452	SMAS1850
	GGWR = .12 + (.12 - .0) * (GGFW - .5) / (.5 - .0)	SMAS1860
461	VOLX = 55. + 95. * GGFW	SMAS1870
	GO TO 460	SMAS1880
452	IF (GGFW .GT. 1.0) GO TO 453	SMAS1890
	GGWR = .180 + (.180 - .12) * (GGFW - 1.) / (1. - .5)	SMAS1900
	GO TO 461	SMAS1910
453	IF (GGFW .GT. 2.0) GO TO 454	SMAS1920
	GGWR = .24 + (.24 - .18) * (GGFW - 2.) / (2. - 1.)	SMAS1930
	GO TO 461	SMAS1940
454	IF (GGFW .GT. 4.0) GO TO 455	SMAS1950
	GGWR = .29 + (.29 - .24) * (GGFW - 4.) / (4. - 2.)	SMAS1960
	VOLX = 80. + 82.5 * GGFW	SMAS1970
	GO TO 460	SMAS1980
455	IF (GGFW .GT. 6.0) GO TO 456	SMAS1990
	GGWR = .310 + (.310 - .29) * (GGFW - 6.) / (6. - 4.)	SMAS2000
	VOLX = 150. + 65. * GGFW	SMAS2010
	GO TO 460	SMAS2020
456	GGWR = .340 + (.340 - .310) * (GGFW - 10.) / (10. - 6.)	SMAS2030

VOLX = 230. + 51.66*GGFW	SMAS2040
460 GGW = GGFW/CGWR*(PNF/400.)*.3	SMAS2050
GO TO 780	SMAS2060
C SOLID PROPELLANT GAS GENERATOR	SMAS2070
470 CONTINUE	SMAS2080
VCTR = WDFMAX / RHOF	SMAS2090
GGPV = 1.1*VCTR*TSUS*PNF/12.	SMAS2100
GGFW = GGPV/(RU*INGG)	SMAS2110
CGW = GGFW/CGMF	SMAS2120
VOLX = (GGFW/.06 + (GGW-GGFW)/0.283)/.85	SMAS2130
GO TO 780	SMAS2140
C RAM AIR TURBOPUMP	SMAS2150
480 IF(IMIN .LT. 0) GO TO 702	SMAS2160
HPOUT = (WDFMAX/RHOF)*PNF*.000152	SMAS2170
HPPUMP = HPOUT/.85	SMAS2180
IF(HPPUMP-7.) 481,481,482	SMAS2190
481 WPUMP = 2.	SMAS2200
GO TO 483	SMAS2210
482 WPUMP = (HPPUMP-7.)*.38 + 2.	SMAS2220
C XCAR CHARACTERISTIC DIMENTION TURBINE DIAMETER	SMAS2230
483 XCAR = 3.625	SMAS2240
TURWT = 3.7+.57*(HPPUMP-7.)	SMAS2250
IF(HPPUMP.LT.7.) TURWT=3.7	SMAS2260
IF(HPPUMP-.65) 484,484,485	SMAS2270
484 TURVOL = 36.5	SMAS2280
GO TO 486	SMAS2290
485 TURVOL = 36.5 + 14.5*(HPPUMP-.65)	SMAS2300
486 SYSWT = 1.2*(TURWT + WPUMP)	SMAS2310
GGW = SYSWT	SMAS2320
GGFW = 0.	SMAS2330
VOLX = TURVOL	SMAS2340
780 CONTINUE	SMAS2350
CALL FMBPAK	SMAS2360
IF(IND .NE. 0) GO TO 60	SMAS2370
SUSMLT = SMLT + XFMR	SMAS2380
SUSMWT = SMWT + WFMR	SMAS2390
702 IF(ISIZE .EQ. 1) GO TO 30	SMAS2400
WTF = SUSWT-SUSMWT	SMAS2410
XCYL = WTF/DELWT	SMAS2420
SUSLT = XCYL + SUSMLT	SMAS2430
GO TO 31	SMAS2440
30 XCYL = SUSLT- SUSMLT	SMAS2450
SUSWT = XCYL*DELWT + SUSMWT	SMAS2460
31 IF(XCYL .LT. 0) GO TO 25	SMAS2470
FUSABL = WCPT + XCYL*DELF*EEXP	SMAS2480
IF(KFM.NE.1) GO TO 51	SMAS2490
IF (ABS(XFOLD/XFMR -1.).LE. .001) GO TO 51	SMAS2500
XFOLD = XFMR	SMAS2510
IMIN = -1	SMAS2520
GO TO 52	SMAS2530
51 WT(1) = SWTFS*0.25	SMAS2540
WT(6) = DELEXI*SUSLT	SMAS2550
TFC = DELF*XCYL*(1.-EEXP)	SMAS2560
TRAPF = TFC+TFC	SMAS2570
XIISUS = 0.C	SMAS2580

	XIIMT = 0.0	SMAS2590
	IF(III(11).EQ.0) GO TO 301	SMAS2600
C	ITEM 1 FITTINGS	SMAS2610
	XII(1) = 0.0	SMAS2620
	ZW(1) = 0.0	SMAS2630
	Z(1) = 0.	SMAS2640
C	ITEM 2 FWD DOME	SMAS2650
	CALL ZFLPLL(EDR,RHO,R,0.0,STKFS,0.0,1,XII(2),Z(2),ZW(2))	SMAS2660
	WT(2) = SWTFS/2.	SMAS2670
C	ITEM 3 FWD BLADDER	SMAS2680
	RP = R-TBLAD	SMAS2690
	X1 = SMLT/2	SMAS2700
	H = X1-TBLAD-STKFS	SMAS2710
	EP = RP/H	SMAS2720
	WT(3) = BLADD/2.	SMAS2730
	CALL ZFLPLL(EB,RHOB,RB,0.0,TBLAD,0.0,1,XII(3),Z(3),ZW(3))	SMAS2740
C	ITEM 4 FWD STIFFNER	SMAS2750
	WT(4) = WCSTB/2.	SMAS2760
	CALL ZCYLLL(.5,WT(4),R,0.0,XII(4),Z(4),ZW(4))	SMAS2770
C	ITEM 5 FWD SKIRT	SMAS2780
	WT(5) = WTATH/2.	SMAS2790
	CALL ZCYLLL(X1,WT(5),R,0.0,XII(5),Z(5),ZW(5))	SMAS2800
C	ITEM 6 EXTERNAL INSULATION	SMAS2810
	D2 = D3/2.	SMAS2820
	CALL ZCYLLL(SMLT,EXINWT,D2,0.0,XII(6),Z(6),ZW(6))	SMAS2830
C	ITEM 7 SIDEWALL CASE	SMAS2840
	WT(7) = DELTK*XCYL	SMAS2850
	CALL ZCYLLL(XCYL,WT(7),R,X1,XII(7),Z(7),ZW(7))	SMAS2860
C	ITEM 8 SIDEWALL BLADDER	SMAS2870
	WT(8) = DELB *XCYL	SMAS2880
	CALL ZCYLLL(XCYL,WT(8),RB,X1,XII(8),Z(8),ZW(8))	SMAS2890
	X2 = X1+XCYL	SMAS2900
C	ITEM 9 AFT SKT	SMAS2910
	WT(9) = WT(5)+XFMB*(DELTK-WTLIN)	SMAS2920
	X3 = X1+XFMB	SMAS2930
	CALL ZCYLLL(X3,WT(9),R,X2,XII(9),Z(9),ZW(9))	SMAS2940
C	ITEM 10 AFT STIFFNER	SMAS2950
	WT(10) = WT(4)	SMAS2960
	CALL ZCYLLL(.5,WT(10),R,SUSMLT,XII(10),Z(10),ZW(10))	SMAS2970
C	ITEM 11 AFT DOME	SMAS2980
	WT(11) = WT(2)	SMAS2990
	CALL ZFLPLL(EDR,RHO,R,0.0,STKFS,X2,0,XII(11),Z(11),ZW(11))	SMAS3000
C	ITEM 12 AFT BLADDER	SMAS3010
	WT(12) = WT(3)	SMAS3020
	CALL ZFLPLL(EB,RHOB,RB,0.,TBLAD,X2,0,XII(12),Z(12),ZW(12))	SMAS3030
C	ITEM 13 FWD PROPELLANT	SMAS3040
	WT(13) = (WCPT + TFD)/2.	SMAS3050
	CALL ZELPSS(EDR,FDAJ,RB,0.0,0.0,1,XII(13),Z(13),ZW(13))	SMAS3060
C	ITEM 14 CYL PROPELLANT	SMAS3070
	WT(14) = DELF*XCYL	SMAS3080
	CALL ZCYLHH(XCYL,WT(14),RB,0.0,X1,XII(14),Z(14),ZW(14))	SMAS3090
C	ITEM 15 AFT PROPELLANT	SMAS3100
	WT(15) = WT(13)	SMAS3110
	CALL ZELPSS(EDR,FDAJ,RB,0.0,X2,0,XII(15),Z(15),ZW(15))	SMAS3120
C	TRAPPED PROPELLANT	SMAS3130

CALL 7CYLL (XCYL,TRAPF,RB,X1,XITP,ZTP,ZWTP)	SMAS3140
WTT=0.0	SMAS3150
ZTT=0.0	SMAS3160
XITOT=0.0	SMAS3170
XMOV =0.0	SMAS3180
XITOF=0.0	SMAS3190
XMOE = 0.0	SMAS3200
DO 310 I=1,12	SMAS3210
WTT=WTT+WT(I)	SMAS3220
310 ZTT=ZTT+ZW(I)	SMAS3230
ZEMTY=(ZTT+ZWTP)/(WTT+TRAPF)	SMAS3240
DO 311 I=13,15	SMAS3250
WTT=WTT+WT(I)	SMAS3260
311 ZTT=ZTT+ZW(I)	SMAS3270
ZSUS= ZTT/WTT	SMAS3280
DO 312 I=1,12	SMAS3290
XITOT = XITOT+XII(I)	SMAS3300
XMOV= XMOV+ (ZSUS-Z(I))*2*WT(I)	SMAS3310
312 XMOE= XMOE+ (ZEMTY-Z(I))*2*WT(I)	SMAS3320
XIIMT = XITOT+XMOE+XITP+(ZEMTY-ZTP)**2*TRAPF	SMAS3330
DO 313 I=13,15	SMAS3340
XITOT = XITOT + XII(I)	SMAS3350
313 XMOV= XMOV+ (ZSUS-Z(I))*2*WT(I)	SMAS3360
XIISUS = XITOT +XMOV	SMAS3370
301 BLADWT= DELB*XCYL+ BLADD	SMAS3380
EXINWT= DELEXI*XCYL + EXMINW	SMAS3390
VTANK=VOLI *XCYL +VFMN	SMAS3400
GROFUL = VTANK*FDAJ	SMAS3410
WINRT= SUSWT -GROFUL	SMAS3420
SFMB = SHELL* XFMB	SMAS3430
TKWT = DELTK*XCYL +SWTFS	SMAS3440
TKLT = XCYL + SMLT	SMAS3450
WTANK = SKTWT+FITNGS+TKWT+BLADWT+WFMB	SMAS3460
VEXIN=EXINWT/RHOX	SMAS3470
VPEOX=VREQ	SMAS3480
GGWX=GGW	SMAS3490
WTFUEL=FUSABL+TRAPF	SMAS3500
KFMX=KFM	SMAS3510
MATTKX=MATTK	SMAS3520
6 FORMAT(SMAS3530
X10X,20HMOD OF INERTIA FULL ,F10.0 ,2X,19HC.G. FULL	,F9.3/SMAS3540
X10X,20HMOD OF INERTIA EMTY ,F10.0 ,2X,19HC.G. EMPTY	,F9.3)SMAS3550
IF (II(15) .EQ. 0) RETURN	SMAS3560
WRITE (6,4)	SMAS3570
4 FORMAT (///25X26HPRAMJET FUEL SYSTEM SUMMARY//)	SMAS3580
IF(II(11).GT. 0)	SMAS3590
1WRITE(6,6) XIISUS, ZSUS,XIIMT,ZEMTY	SMAS3600
WRITE(6,300)IB	SMAS3610
300 FORMAT(10X,10HMATERIAL ,3A4/)	SMAS3620
WRITE(6,5) SUSWT, SUSLT, SUSMWT, SUSMLT, D3,TKLT,WFMB,XFMB,GGW,WFC,	SMAS3630
1SFMB,GGFW,WINRT,TKWT,RHO,STKFC,SKTWT,BLADWT,FITNGS,EXINWT,VTANK,	SMAS3640
2FDAJ,FUSABL,TRAPF,EXIN,TBLAD	SMAS3650
5 FORMAT(SMAS3660
X10X,20HSYSTEM TOTAL WEIGHT ,F10.2,2X,19HSYSTEM TOTAL LENGTH,F9.3/	SMAS3670
X10X,20HMINIMUM SUS WEIGHT ,F10.2,2X,19HMINIMUM SUS LENGTH ,F9.2/	SMAS3680

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X10X,20HDIAMETER ,F10.2,2X,19HTANK LENGTH ,F9.2/ SMAS3690
X10X,20HFUEL MGMT BAY WEIGHT,F10.2,2X,19HFUEL MGMT BAY LENTH,F9.3/ SMAS3700
X10X,20HEXPULSION SYS WEIGHT,F10.2,2X,19HFUEL CONTROL WEIGHT,F9.2/ SMAS3710
X10X,20HFMB SHELL WT ,F10.2,2X,19HPRESSURANT WEIGHT F9.2//SMAS3720
X10X,20HSYS TOTAL INERT WT ,F10.2,2X,19HBARE TANK WEIGHT ,F9.2/ SMAS3730
X10X,20HCASE MATL DENSITY ,F10.4,2X,19HCASE THICKNESS ,F9.3/ SMAS3740
X10X,20HSHIRTS AND STENERS ,F10.2,2X,19HBLADDER WEIGHT ,F9.2/ SMAS3750
X10X,20HFITTINGS ,F10.2,2X,19HEXTERN INS WT,TANK ,F9.2//SMAS3760
X10X,20HFUEL TANK VOLUME ,F10.2,2X,19HFUEL ADJUSTED DENS ,F9.5/ SMAS3770
X10X,20HUSABLE FUEL ,F10.2,2X,19HUNUSABLE FUEL ,F9.2//SMAS3780
X10X,20HEXT INSUL THICKNESS ,F10.3,2X,19HBLADDER THICKNESS ,F9.3/ SMAS3790
RETURN SMAS3800
35 IF ( II(15) .EQ. 0 ) RETURN SMAS3810
WRITE (6,36) MATTK, MATPB SMAS3820
36 FORMAT(' ERROR IN SUBROUTINE MATLS ',5I2) SMAS3830
RETURN SMAS3840
38 IF ( II(15) .EQ. 0 ) RETURN SMAS3850
WRITE (6,39) HP SMAS3860
39 FORMAT(2X,42HERROR TRYING TO OBTAIN ATTITUDE DATA,ALT = ,F8.1) SMAS3870
RETURN SMAS3880
48 IF ( II(15) .EQ. 0 ) RETURN SMAS3890
WRITE (6,49) SMAS3900
49 FORMAT(44H ERROR TRYING TO CONVERGE ON N2 BOTTLE SIZE ) SMAS3910
GO TO 37 SMAS3920
60 IF ( II(15) .EQ. 0 ) RETURN SMAS3930
WRITE (6,61) SMAS3940
61 FORMAT(16H ERROR IN SUSMAS //) SMAS3950
GO TO 37 SMAS3960
25 IF ( II(15) .EQ. 0 ) RETURN SMAS3970
WRITE (6,26) SMAS3980
26 FORMAT(2X,51HERROR TANK LENGTH LESS THAN FMB + ELIPTICAL ENDS +1 )SMAS3990
IND = 1 SMAS4000
37 IF ( II(15) .EQ. 0 ) RETURN SMAS4010
WRITE (6,27) TX SMAS4020
27 FORMAT(8F15.6) SMAS4030
RETURN SMAS4040
2014 IF ( II(15) .EQ. 0 ) RETURN SMAS4050
WRITE (6,2015) AMACH,ALPHAV SMAS4060
2015 FORMAT( /10X,34HFAILURE TRYING TO READ INLET MAP / SMAS4070
110X, 7HAMACH = ,F10.5, 8H ALF1 = ,F10.5 ) SMAS4080
WRITE (6,545) BOMB,IARI(MUM) SMAS4090
545 FORMAT (' 1ST IND VARIABLE=',E12.5,' 2ND IND VARIABLE= ',E12.5,' SSMAS4100
1UPTABLE =',F10.3,' SUBTABLE SIZE =',F10.3/' THE VARIABLE OUT OF RASMAS4110
2NCE IS THE ',A4,' INDEPENDENT VARIABLE'//) SMAS4120
RETURN SMAS4130
END SMAS4140

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SUBROUTINE XALPHA ( NDESPT ) XAL F0010
PGM=NUK.CM-CGSM RKM/GSM FIV-EBCD 7/11/73 XAL F0020
C XAL F0030
C TEMPORARY MODS. FOR PROPULSION CHECKOUT ARE DENOTED BY-----XAL F0040
C XAL F0050
COMMON /FAILUR/ KFAIL XAL F0060

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COMMON /SKINF/ CDSKNF(10), XLBDY, KMANY	XALF0070
COMMON /EXTERN/ AR5(5), AR15(15)	XALF0080
COMMON /AERPRO/ CCODES(10), CLADES(10)	XALF0090
COMMON/BOAT/CDPBT, DUM9(9), CDBOAT(10)	XALF0100
COMMON/COEXX/ II(16)	XALF0110
EQUIVALENCE (II(15), IPRX)	XALF0120
EQUIVALENCE (II(13), IEX)	XALF0130
COMMON/FXXRJ/ FX(48)	XALF0140
EQUIVALENCE (FX(28), XRJ)	XALF0150
COMMON/ALFBLK/ AMACH, A, ALT, GAMRAD, ACCN, ACCT, CDD, Q, SREF,	XALF0160
1 ACWT, ALPHA, CFNREQ, REG, CLALFD	XALF0170
COMMON /INDATA/ CDINL, XX, YY	XALF0180
COMMON /RJDAT/ XNZ7(7), BOSTLT, BOSTPR	XALF0190
COMMON /SUSDAT/ TX(44)	XALF0200
EQUIVALENCE (TX(33), SUSLT)	XALF0210
EQUIVALENCE (AR5(1), PLLT)	XALF0220
NAMELIST/XALPH1/ACCN1, ACCT1, ACWT, AEROPT, ALPHD, ALPHD1, ALT1,	XALF0230
1AMACH1, CDD, CDI, CL, CL1, DGDODA, GAMDEG, GDT, GDT1, GDTSTR,	XALF0240
2GTST, Q, SREF, TGUSS, TTEST, V, VDOT, XL, XL1, DIND, CFNREQ,	XALF0250
3CFNTGS	XALF0260
DATA DEC/57.29578/	XALF0270
C STATEMENT FUNCTION IS SUBSTITUTED FOR FUNCTION SUBPROGRAM	XALF0280
DTLU(AMACH, ALFDEG, NARG)= CLALFD*ALFDEG	XALF0290
C	XALF0300
AMACH1=AMACH	XALF0310
ALT1=ALT	XALF0320
XLTOT = BOSTLT + SUSLT + PLLT	XALF0330
IF(IEX.EQ.1) XLTOT=SUSLT+PLLT+XRJ	XALF0340
AR15(1) = XLTOT	XALF0350
ACCN1=ACCN	XALF0360
ACCT1=ACCT	XALF0370
CDI=0.	XALF0380
DIND=0.	XALF0390
TTEST=0.	XALF0400
CFNREQ=C.	XALF0410
CFNTGS=0.	XALF0420
G=32.17405	XALF0430
R=ALT + 20.89956E6	XALF0440
QS=Q*SREF	XALF0450
V=AMACH*A	XALF0460
GDTSTR=ACCN*G/V	XALF0470
VDOT = ACCT * G	XALF0480
AM = ACWT / G	XALF0490
ATMV = 1. / (AM * V)	XALF0500
C	XALF0510
C	XALF0520
C	XALF0530
REMOVE KLINE AND DKLINE	XALF0540
CDD = CCODES(NDDESPT)	XALF0550
CDD=CDD-CDBOAT(NDDESPT)+CDPBT	XALF0560
CLALFD = CLADES(NDDESPT)	XALF0570
NPM = 1	XALF0580
CALL INLIFT (NRM, CLAINL, CDBON)	XALF0590
CLALFD = CLALFD + CLAINL	XALF0600
CDFR = CDSKNF(NDDESPT) * XLTOT / XLBDY	XALF0610
CDD = CDD + CDINL + CDBON + CDFR - CDSKNF(NDDESPT)	

GPAR=L./V*((V**2/R)-G)*COS(GAMRAD)	XALF0620
TPAR = AM * (V*DT + G*SIN(GAMRAD)) + QS * CDD	XALF0630
GAMDEG=GAMRAD*DEG	XALF0640
TGUESS=TPAR	YALF0650
ALPHA=0.	XALF0660
C	XALF0670
C LOOP 600 ITERATES ON REQUIRED CFN	XALF0680
DO 600 I=1,10	XALF0690
C	XALF0700
C LOOP 100 ITERATES ON ANGLE OF ATTACK	XALF0710
DO 100 J=1,10	XALF0720
CL=DTLU(AMACH,ALPHA*DEG,4)	XALF0730
XL=CL*QS	XALF0740
GDT=AIMV*(TGUESS*SIN(ALPHA)+XL)+GP	XALF0750
GDTSTR=ABS(GDT-GDTSTR)	XALF0760
GTEST=GDTSTR*V/G	XALF0770
C TESTS INPUT NORMAL ACCELERATION AGAINST NORMAL ACCELERATION	YALF0780
C CALCULATED FROM THE GAMMA DOT OBTAINED BY ITERATING	XALF0790
C THE ANGLE OF ATTACK	XALF0800
IF (GTEST.LE. 1.E-4) GO TO 300	YALF0810
C	XALF0820
C NEWTON-RAPHSON ITERATION OF ANGLE OF ATTACK FOR GAMMA DOT	XALF0830
DALPHA=0.001	XALF0840
ALPHA1=ALPHA + DALPHA	XALF0850
CL1=DTLU(AMACH,ALPHA1*DEG,4)	XALF0860
XL1=CL1*QS	XALF0870
GDT1=AIMV*(TGUESS*SIN(ALPHA1)+XL1)+GP	YALF0880
DGDTDA=(GDT1-GDT)/DALPHA	XALF0890
ALPHA=ALPHA+(GDTSTR-GDT)/DGDTDA	XALF0900
ALPHD=ALPHA*DEG	YALF0910
ALPHD1=ALPHA1*DEG	XALF0920
100 CONTINUE	XALF0930
IF (IPRIX.GT.0) WRITE(6,XALPH1)	XALF0940
IF (IPRIX.GT.0) WRITE(6,200)	YALF0950
200 FORMAT(// 'SUBROUTINE XALPHA ITERATION FOR ANGLE OF ATTACK FAILED')	XALF0960
GO TO 777	XALF0970
C	XALF0980
300 CONTINUE	XALF0990
C INDUCED DRAG COEFFICIENT = CL * TAN(ALPHA)	XALF1000
400 CDI=CL*TAN(ALPHA)	YALF1010
500 DIND=CDI*QS	XALF1020
T=(1./COS(ALPHA))*(TPAR+DIND)	XALF1030
CFNREQ=T/QS	YALF1040
CFNTGS=TGUESS/QS	XALF1050
TTEST=ABS(CFNREQ-CFNTGS)	XALF1060
C	XALF1070
C TESTS FOR CONVERGENCE OF CFN REQUIRED	XALF1080
IF (TTEST.LE. 1.E-5) GO TO 800	XALF1090
TGUESS=T	XALF1100
600 CONTINUE	XALF1110
IF (IPRIX.GT.0) WRITE(6,XALPH1)	XALF1120
IF (IPRIX.GT.0) WRITE(6,200)	XALF1130
700 FORMAT(// 'SUBROUTINE XALPHA ITERATION FOR CFN REQUIRED FAILED')	XALF1140
777 KFAIL = 13	XALF1150
RETURN	XALF1160

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800 CONTINUE
  IF ( IPRIX .GT. 1 ) WRITE(6,XALPH1)
  RETURN
END

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XALF1170
XALF1180
XALF1190
XALF1200

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      SUBROUTINE ADM(KFAIL,KSTEP)
C     COMPUTE AERO TABLES
C     TABLE 1 FOR BOOSTER ON + INLETS FAIRED
C     TABLE 2 FOR RAMJET ON + INLETS OPEN
      COMMON /PERF/PE7(7),NLPHAZ,P502(502),NAERO(20),IPTYPE(20),P(120)
      KFAIL = 0
101 CONTINUE
910 CONTINUE
      CALL AERMOD(KFAIL,KSTEP)
      RETURN
END

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ADM 0010
ADM 0020
ADM 0030
ADM 0040
ADM 0050
ADM 0060
ADM 0070
ADM 0080
ADM 0090
ADM 0100
ADM 0110

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C     SUBROUTINE AERMOD ( KFAIL, KSTEP )
      PGM=NUK.CMCGSM      GGJ/RKM      FIV/EBCD      9/10/73
      DOUBLE PRECISION CVV, CVVT, CVVW
      DOUBLE PRECISION Q, Q1, Q2, A1, A2, ZTZ
      COMMON/AERO/

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AERMO010
AERMO020
AERMO030
AERMO040
AERMO050

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1	ATNS4T	,ATNS4W	,BTANA	,BART	,BARW	,BAPT	,	AERMO060
2	BAPW	,BAPPT	,BAPPW	,BETA	,BFN	,CFT	,	AERMO070
3	CFW	,CDB	,CFB	,CNANAC	,CLABT	,CLAT	,	AERMO080
4	CLAW	,CLTV	,CKWB	,CKBW	,CKBT	,CKTB	,	AERMO090
5	CLATWV	,D	,DD	,DD2	,DPR	,DHL	,	AERMO100
6	FAFN	,F	,FL	,FR	,PI	,RLD	,	AERMO110
7	RLDB	,RBTANA	,SLETR	,SLEWR	,STSREF	,SWSREF	,	AERMO120
8	SKRT	,SKTR	,SKBW	,SKWB	,TRTP1	,TRWP1	,	AERMO130
9	CFI	,TANST	,TANSW	,TANS4T	,TANS4W	,TANS2T	,	AERMO140
A	TANS2W	,XD1R	,XD1BT	,XD1T	,XD1W	,XNLCMB	,	AERMO150
B	XNLCDB	,ACT	,ACW	,XNLCB	,BDDYL	,TAILL	,	AERMO160
C	WINGL	,RLISQR	,DISQR	,FR1	,FCAP	,CDPNX	,	AERMO170
D	ACAP	,TN1	,SPN	,VPN	,FAFN1	,PMN	,	AERMO180
E	AN0SE2	,SWSBN	,RN0SE2	,XLINF	,CR2	,NCON(3)	,	AERMO190
F	CRFMAX	,CRAMAX	,BZ	,CNVR	,BI	,BZ	,	AERMO200
G	SV2	,SLEI	,SLEZ	,XVA	,XVB	,XVC	,	AERMO210
H	CT2	,CX	,VOLN	,VOLBT	,VOLBOD	,SWBREF	,	AERMO220
I	PRAT	,ROG						AERMO230

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      COMMON/AERZ/ CDOB,CDOH,CDDT,CDOON,CDOOFF,CDBON,CDBOFF,CDOI ,ITRIP,
1FRBT,FPB,NAEROX(30)

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AERMO240
AERMO250

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      COMMON /ARINDX/ JJRUN,KKRUN,ARIN(8)

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AERMO260

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      COMMON /FIX/ CVV,FM,ALPHA0,ALT

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AERMO270

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      COMMON /FIXUP/ DA,DD12,FX8(8)

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AERMO280

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      COMMON /SAVTIM/ DSUM6(6)

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AERMO290

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      COMMON /SUMLIF/ DSUM42(420)

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AERMO300

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      COMMON /SUMOUT/ DSUM56(560)

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AERMO310

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      COMMON /TWJ/ GPDEG,ALPTRM,CLATRM,DELTRM

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AERMO320

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      COMMON /TWX/ RHLTW,VCHAV,VCHDV,CHV1,DYNP,ALINW,CNINW,WMISX

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AERMO330

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      COMMON /TWY/ CHAW,CHDW,CNDW,CNDT,CHAT,CHDT,CLP,CLRD,CMO,CMAB,

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AERMO340

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1      CMAT,CMAW,CMADDT,CMDDOT                                AERM0350
COMMON /WIV/ SWING,CNA,SWX,STS,SLEW,SLET,D6,SEWFT,SETFT      AERM0360
COMMON /AFTAR/ ARVT,TRVT,BVT,RCVT,TCVT,TANSVT                AERM0370
1      ,STEVT,GGMIS(7)                                         AERM0380
COMMON /BASVAR/ LWOPT,ZXZ19(19)                               AERM0390
COMMON/RLKQ/ Q1(20),Q(96),Q2(96),                            FRCTN1(42),FRCTN2(90) AERM0400
1      ,FRCTN3(42)                                             AERM0410
COMMON /RYAIR/ ZRZF,XZML1(20),XZML2(20),SMUK(60),           AERM0420
1      COEFL(20),COEFFQ(20),CLUK(60),                         AERM0430
2      XZMD1(20),XZMD2(20),DMUK(60),                         AERM0440
3      COEFD(20,5),COEFD(20,5),CDDK(20,5,3)                 AERM0450
COMMON /CODEFX/ KIND,IKIN(15)                                 AERM0460
COMMON/DRG/                                                    AERM0470
1      D1 ,THFTAC ,FINE ,RS ,R1 ,RL1 , AERM0480
2      XCYL ,XTHBT ,XBT ,RL3 ,ITN ,AMACW , AERM0490
3      AMACT ,THKRT ,THKRW ,RL1A ,IBTL ,ATCT , AERM0500
4      ATCW ,DML ,ITSECT ,IWSECT ,RXINT ,RXINW , AERM0510
5      BTANST ,BTANSW ,RCW ,FLTSEW ,XLENW ,FLTSFT , AERM0520
6      XLENT ,QRATIO ,DN ,DE ,D3 ,RCT , AERM0530
7      NW ,TCW ,TCT ,BT ,BW ,ART , AERM0540
8      ARW ,TRT ,TRW ,SREF ,DB , AERM0550
COMMON /EXTERN/ ZARZ(20)                                       AERM0560
COMMON /FORNOW/ NRM,NALT,RMV,ALTV,FRBIX,FACTOR               AERM0570
COMMON/LFT/                                                    AERM0580
1      ATNS2T ,ATNS2W ,SEW ,SET ,DMW ,DMT , AERM0590
2      RL4 ,RL5 ,ALPHAR ,RITWV ,IART ,ICNTRL , AERM0600
3      D2 ,RL2 , AERM0610
COMMON /NAERC/ TNOZL,STE,STET,TRAT,SWE,TRAW,DCASE,DFCD,ARL6, AERM0620
1      AL5X,XMSX,STEW,XSTA,F5OVCH,F5OVCT,WMISS,SMRL,SMRH,WWING, AERM0630
2      IZUMP,IPLUML,NCGUM,THNGL,TNZL,TLTHEO AERM0640
COMMON /PRINTR/ IKP3(3),IAIR,JKP3(3) AERM0650
COMMON/ROLL/ RNW,RNT,IARW,BWH,BTH AERM0660
COMMON /SURFX/ SUR17(17),SVT,SUR7(7) AERM0670
COMMON /TOVPER/ CUM555(5),SEXITZ,DUM666(66) AERM0680
COMMON /UPINLT/ PRAMBL(128),XCPI ,XCXGD AERM0690
COMMON/VERT/ SVTSRF, BARVT, TANOVT, TAN2VT, TAN4VT, AERM0700
1      ACVT, ATN2VT, ATCVT, AMACVT, TMACVT, BTANVT, AERM0710
2      BDCVT, TRTPV1, BAPPVT, BAPVT, FLVTST, XLENVT, AERM0720
3      CFVT, TRAVT, RXINVT, F5OVVT AERM0730
COMMON/WLOC/ XD11 AERM0740
COMMON /XINERT/ ZZX26(45),PANWW,XXZ71(71) ,PANWT,XXZ14(14) AERM0750
COMMON /XXXXX/ CLALPB,SREFB AERM0760
COMMON/XYZ/CMA,XD1,CMQ AERM0770
DIMENSION COEFM(20),COEFX(20) AERM0780
DIMENSION RMV(20),ALTV(10),ALPHAV(10),NAERO(30) AERM0790
EQUIVALENCE(XMO,RM),(RL6,XLDEGE),(HTOT,BINW),(RNI,RNLDEG), AERM0800
1(AV,XLDIV),(HBLD,HBLDIV),(SDIV,ABLDIV) AERM0810
EQUIVALENCE(RL3,XLM) AERM0820
EQUIVALENCE(DMN,XMF),(AV,XLDIV) AERM0830
1 FORMAT(//I3,2X,A6,6(2H, ,A6,2H=,E10.3)) AERM0840
1840 FORMAT(1H,15X,106H THIS ANALYSIS IS LIMIT EAERM0850
1 D TO THE FOLLOWING CONDITIONS -/ ) AERM0860
1841 FORMAT(29X,47H1. MACH. NUMBERS 0 TO 0.9,1.0, AND 1.2 TO 10. ) AERM0870
1842 FORMAT(39X,55H2. ANGLES OF ATTACK LESS THAN OR EQUAL TO 30.0 DEGAERM0880
1RFFS ) AERM0890

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1843 FORMAT(39X, 61H3. SURFACE LEADING EDGE SWEEPS BETWEEN 0.0 AND 62AERM0900
 1.5 DEGREES) AERM0910
 1844 FORMAT(39X, 54H4. SURFACE THICKNESS RATIOS LESS THAN OR EQUAL TO AERM0920
 10.1) AERM0930
 1944 FORMAT(39X, 38H5. ALTITUDE LIMITED TO 0 TO 100 K FT./) AERM0940
 1845 FORMAT(10X, 42HC O N F I G U - A T I O N O P T I O N S, AERM0950
 1 10X, 13HOPTION CHOSEN/ AERM0960
 2 16X, 23HTYPE OF NOSE (ITN), 25X, 6HITN = , 11/ AERM0970
 3 19X, 22H1 = THREE-FORTHS POWER/19X, 13H2 = L-O HAACK/ AERM0980
 4 19X, 8H3 = CONE/19X, 13H4 = L-V HAACK/ AERM0990
 5 19X, 17H5 = TANGENT OGIVE / 19X, 13H6 = SPHERICAL, AERM1000
 6 / 19X, 16H7 = BLUNTED CONE, / 19X, 17H8 = BLUNTED OGIVE/ AERM1010
 1846 FORMAT(16X, 24HLUG CONDITION (ILUG), 23X, 7HILUG = , 11/ AERM1020
 1 19X, 18H0 = LUGS RETRACTED/19X, 17H1 = LUGS STANDING) AERM1030
 1847 FORMAT(16X, 29HTYPE OF BOAT-TAIL (IBTL), 18X, 7HIBTL = , 11/ AERM1040
 1 19X, 13H1 = PARABOLIC/19X, 8H2 = CONE/19X, 8H3 = ACNE) AERM1050
 1848 FORMAT(16X, 32HWING OR CANARD CONDITION (NW), 17X, 5HWN = , 11/ AERM1060
 1 19X, 21H0 = NO WING OR CANARD/19X, 18H1 = WING OR CANARD) AERM1070
 1849 FORMAT(16X, 30HCONTROL CONDITION (ICNTRL), 15X, 9HICNTRL = , AERM1080
 1 11/ 19X, 16H1 = TAIL CONTROL/19X, 16H2 = WING CONTROL/ AERM1090
 2 19X, 18H3 = CANARD CONTROL) AERM1100
 1851 FORMAT(16X, A4, 18H ARRANGEMENT (, A4, 1H), 20X, A4, 3H = , AERM1110
 1 11/ 19X, 25H2 = PLANAR OR + CRUCIFORM/19X, 12H3 = TRI-FORM/19X, AERM1120
 2 15H4 = X CRUCIFORM) AERM1130
 1852 FORMAT(1H , 9X, 105HC O N F I G U R A T I O N D I M E N S I O N AERM1140
 1S (ALL LENGTHS IN INCHES, ALL ANGLES IN DEGREES)///10X, AERM1150
 2 5HB O C Y -//20X, 87HCYLINDER INLET FORWARD BOAT-TAIL AERM1160
 3L FORWARD BASE NOZZLE/20X, 88HC DIAMETER AERM1170
 4 DIAMETER DIAMETER DIAMETER DAERM1180
 5 DIAMETER//19X, 4HD1 = , F6.2, 10X, 4HD6 = , F6.2, 10X 4HD2 = , F6.2, AERM1190
 6 10X, 4HD3 = , F6.2, 10X, 4HDN = , F6.2//) AERM1200
 1853 FORMAT(57X, 14HTAIL MOUNTING/59X, 8HDIAMETER//59X, 5HDMT = , AERM1210
 1 F6.2//) AERM1220
 1854 FORMAT(37X, 14HTAIL MOUNTING, 26X, 14HWING MOUNTING/ AERM1230
 1 40X, 8HDIAMETER, 32X, 8HDIAMETER//39X, 5HDMT = , F6.2, 29X, AERM1240
 2 5HDMW = , F6.2//) AERM1250
 1855 FORMAT(18X, 74HNOSE LENGTH INLET FORWARD BOAT-TAIL FOR AERM1260
 1WARD OVERALL LENGTH/20X, 67HSTATION STATION AERM1270
 2 STATION STATION//18X, 5HRL1 = , F7.2, 8X, 5HRL6 AERM1280
 3 = , F7.2, 8X, 5HRL2 = , F7.2, 8X, 5HRL3 = , F7.2//) AERM1290
 1856 FORMAT(55X, 19HTAIL LEADING EDGE/60X, 7HSTATION//58X, 5HRL4 = , AERM1300
 1 F7.2//) AERM1310
 1857 FORMAT(25X, 19HTAIL LEADING EDGE, 14X, 31HWING OR CANARD LEADIAERM1320
 *NG EDGE/ AERM1330
 1 40X, 7HSTATION, 33X, 7HSTATION//38X, 5HRL4 = , F7.2, 28X, 5HRL5 = AERM1340
 2, F7.2//) AERM1350
 1858 FORMAT(10X, A8//21X, 4HROOT, 16X, 3HTIP, 14X, 10HEQUIVALENAERM1360
 1T, 10X, 9HNUMBER OF, 9X, 12HLEADING EDGE/20X, 5HCHORD, 15X, AERM1370
 2 5HCHORD, 16X, 4HSPAN, 15X, 6HPANELS, 14X, 5HSWEEP// AERM1380
 3 18X, 2HRC, A1, 2H = , F6.2, 9X, 2HTC, A1, 2H = , F6.2, 9X, 1HB, AERM1390
 4 A1, 2H = , F6.2, 10X, 2HRN, A1, 2H = , F6.2, 7X, 3HSLE, A1, 2H = , AERM1400
 5 F6.2//38X, 9HTHICKNESS, 29X, 13HPPOINT OF MAX./40X, 5HRATIC, 33X, AERM1410
 6 9HTHICKNESS//36X, 4HTHKR, A1, 2H = , F6.3, 27X, 4HRXIN, A1, 2H = , AERM1420
 7 F6.3//) AERM1430
 1859 FORMAT(19X, 35H5 = HORIZONTAL AND VERTICAL STABILIZERS) AERM1440

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1860 FORMAT( 42H L I N E A R   C O E F F I C I E N T S -////
1      44H MACH. ANGLE OF ZERO LIFT DRAG ZERO LIFT D, AFRM1450
2      44H RAG TOTAL LIFT CONTROL LINEAR , AFRM1460
3      44H CENTER / AFRM1470
4      44H NO. ATTACK POWER OFF POWER ON, AFRM1480
5      44H CURVE SLOPE EFFECTIVENESS OF PRE, AFRM1490
6      44H SSURE /// AFRM1500
7 F5.1, F8.2, 3X, A6, 2H =, F6.3, 2X, A6, 2H =, F6.3, 2X, A6, AFRM1510
8 2H =, F6.3, 2X, A6, 2H =, F6.3, 2X, A6, 2H =, F5.2//////// AFRM1520
9      43H T O T A L   C O E F F I C I E N T S -//// AFRM1530
A      44H MACH. ANGLE OF TOTAL DRAG TOTAL DPA, AFRM1540
B      44H G TOTAL CONTROL TRIM, AFRM1550
C      44H MED CONTROL TOTAL CENTER / AFRM1560
D      44H NO. ATTACK POWER OFF POWER ON, AFRM1570
E      44H LIFT LIFT LIF, AFRM1580
F      44H DEFLECTION OF PRESSURE /// AFRM1590
1861 FORMAT(F5.1, F8.2, 4X, 7HCDOFF =, F6.3, 4X, 6HCDON =, F6.3, 6X, AFRM1600
1 4HCL =, F5.2, 4X, 3HCDL, A1, 2H =, F5.2, 3X, 8HCLTRIM =, F6.2, AFRM1610
2 6X, 1HC, A1, 2H =, F5.1, 4X, 8HTOTXD1 =, F6.2/) AFRM1620
1875 FORMAT(1H ,18H A L T I T U D E = ,F7.0,3HKFT) AFRM1630
1876 FORMAT( 16H MACH. NUMBER = , F4.2, 5X, 8HALPHA = , F5.2, AFRM1640
1 5H DEC., 5X, 11HALTITUDE = , F4.1, 6H K FT., 10X, AFRM1650
2 38H L I N E A R   A E R O D Y N A M I C S) AFRM1660
2850 FORMAT(13H M A C H = , F5.2, 2X, 7HSREF = , F7.2, 2X, 5HD1 = , AFRM1670
1 F5.2, 2X, 9HXCG/D1 = , F5.2, 2X, 5HWT = , F5.0, 1X, 2HQ =, F7.0 ,2X, AFRM1680
2 5HHL = , F5.1, 2X, 8HSTAIL = , F5.0, 2X, 8HSWING = , F5.0/ AFRM1690
3 20X, 9HALFMAX = , F7.2, 2X, 8HCNMAX = , F7.2 AFRM1700
4 /45H L I N E A R   C O E F F I C AFRM1710
5 I F M T S ---//44H ALPHA CDO OFF CDO ON CN ALPHA CN D, AFRM1720
6 79HELTA XCP/D1 CMA BODY CMA TAIL CMA WING CMA TOTAL AFRM1730
7CMQ CMDT CMDW/ AFRM1740
8 2X, F5.2, 2F9.3, F10.3, 2F11.3, F8.3, F11.3, F12.3, F11.3, 5X, F7.0, AFRM1750
9 2F7.3/10X, 6HCMADDT, 2X, 6HCMDDOT, 3X, 3HC1P, 2X, 7HC1DELTA, AFRM1760
A 4X, 6HCF/ALF, 2X, 6HCH/DEL, 3X, 5HDELTA, 6X, 3HCMO/ AFRM1770
B 10X, F6.0, 2X, F6.0, 1X, F6.2, 2X, F6.3, 3X, F6.3, 2X, F6.3, AFRM1780
C 4X, F6.3, 5X, F6.3/) AFRM1790
2852 FORMAT(F8.2, F10.3, F13.3, 2F11.3, F10.3, F11.3, 2F12.3, F9.3, F13.3, F11.3 AFRM1800
1) AFRM1810
2853 FORMAT(16X, 14H SKIN CONDITION/16X, 22H AERODYNAMICALLY SMOOTH) AFRM1820
C AFRM1830
C AFRM1840
C AFRM1850
C AFRM1860
C *****NAMELIST INPUT DEFINITIONS AFRM1870
C AFRM1880
NAMELIST/GEOMET/ D1, D2, D3, D6, DN, AFRM1890
1 RL1, RL2, RL3, RL4, RL5, RL6, AFRM1900
2 ITN, IBTL, ILUG, NW, J, ICNTRL, ESRK AFRM1910
3, ICDDN, ICDDF, ICLTF, ICLTN, ICONP, DMAX, DDEL, IPLDT, WT, XINW, INTYPE AFRM1920
4, PNOSE, RL1A, ICONDU, BLC1, BLC2, BLC3, PHIG, HCD, WCD, NCD AFRM1930
NAMELIST/TAIL/ DMT, RCT, TCT, BT, THKRT, RXINT, RNT, SLET, IART, AFRM1940
1 RHLT, ITSECT, FSOVCT, STETI AFRM1950
NAMELIST/WING/ DMW, RCW, TCW, BW, THKRW, RXINW, RNW, SLEW, IARW, AFRM1960
1 RHLW, IWSECT, FSOVCW, STEWI, IEPW, THKREP, SLEE, HE AFRM1970
NAMELIST/MALPHA/NRM, RMV, NALPHA, ALPHAV, NALT, ALTV, RLCGV AFRM1980
NAMELIST/INTWO/ RL6A, R7, RL7A, RL7B, RL9, RL10, BINW, DMN, HBLD, XLINF AFRM1990

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NAMFLIST/INCH/ A6, A7, A8, A9, AL4, AL5, RL6, RL7, RL8, RL9,	AERM2000
1 IRTLC, DR, DL, DR, HLD, DMN, XMLV, XMS, AMFR	AERM2010
2 , R6, R7, R8, R9, PLV , DEPT	AERM2020
NAMFLIST/POD/ ENPOD, CSTRUT, TCSTRUT, AEAB, BSTRUT, XCL, CLSTA,	AERM2030
1 PODRAD, XLIP, PODCCG, PODTHE, PDLGTH, RLEPOD, THETAB, THETAC	AERM2040
NAMFLIST/INPUT/	AERM2050
1NAERO, BTH, RXINT, STE, STET, TRT, TRAT, BWH, RXINW, SWE, STET,	AERM2060
1TRW, TRAW, DCASE, DEOD, DE, THNGL, TNOZL, ARL6, AL5X, XMSX, BRAT,	AERM2070
2FINE, TLTHED, STEW, RL4, RL5, FACTOR, RNT, RXINT, RNW, NRM, NALT,	AERM2080
3ALTV, PANWT, PANWW, RMV, XSTA, FRBT, FSOVCW, FSOVCT, XCGD1, WMISS	AERM2090
1 , SMRL, SMRH, WWING	AERM2100
NAMFLIST/WINLOC/ RMLD, XD11, XD1, WWING, WMISS, DCGDX, SMLC, SMRL,	AERM2110
1CELXW, RL5, XLEW, XD2, XCGD1, SMHI, SMRH, DCPDX, RMHI, RM	AERM2120
NAMFLIST/FORCES/ALPHAR, CL, DYNP, DI, DZERO, DTOT, VLIFT, ALD, AMLF	AERM2130
C DATA RTOD/ 0.01745329252 /	AERM2140
POLY (X,C0,C1,C2,C3) = X * (X*(C3*X + C2) + C1) + C0	AERM2150
50 CONTINUE	AERM2160
C*****SET CONFIGURATION CODE VALUES*****	AERM2170
NAEROX(15) = IAIR	AERM2180
DO 9748 IA = 1, 30	AERM2190
NAERO(IA) = NAEROX(IA)	AERM2200
9748 CONTINUE	AERM2210
J = NAERO(15)	AERM2220
IF (NPM .GT. 19) NRM = 19	AERM2230
STEVTR = STEVT / 57.296	AERM2240
RL5SAV = RL5	AERM2250
RL5 = RL5 * .01 * TLTHED	AERM2260
NTEN = 10	AERM2270
WMISS=ZARZ(5)	AERM2280
KINDR = MOD(KIND,NTEN)	AERM2290
C FIX XCGD1	AERM2300
XCGD1 = 5.	AERM2310
TNZZL = TNOZL	AERM2320
PI = 3.141593	AERM2330
DE = SQRT (576. * SEXITZ / PI)	AERM2340
DEOD = DE	AERM2350
ITN = NAERO(1)	AERM2360
IPTL = NAERO(2)	AERM2370
ILUG = NAERO(3)	AERM2380
NW = NAERO(4)	AERM2390
ICNTRL = NAERO(5)	AERM2400
IART = NAERO(6)	AERM2410
IARW = NAERO(7)	AERM2420
ITSECT=NAERO(10)	AERM2430
IWSECT=NAERO(11)	AERM2440
IPLOT = NAERO(16)	AERM2450
NOGVAR = NAERO(30)	AERM2460
C***** FAIL-SAFE CHECKS	AERM2470
C	AERM2480
IF(NAERO(10).EQ.3.AND.FSOVCW.EQ.0.) FSOVCW = .7	AERM2490
IF(NAERO(11).EQ.3.AND.FSOVCT.EQ.0.) FSOVCT = .7	AERM2500
IF(NAERO(11).LT.3) FSOVCT=0.0	AERM2510
IF(NAERO(10).LT.3) FSOVCW=0.0	AERM2520
IF(NAERO(10).EQ.C) NAERO(10) = 1	AERM2530
	AERM2540


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IF(NAERO(11).EQ.0) NAERO(11) = 1
RNW = 2.
IF(IARW.EQ.4) RNW=4.0
PI=3.14159
CPR = 57.29578
C*****BODY GEOMETRY*****
D1 = DCASE
RLN = FINE
RL1 = RLN*D1
RL2 = TLTHED
RL3 = TLTHED
C2 = DCASE
C3 = DCASE
CLF = DCASE
CTE = DCASE
THNGL = TLTHED -1. -.5 * RCT
RL4 = TLTHED -1. - RCT
XSTA = TLTHED -1. - RCVT
RPLT = THNGL
R1=0.5*D1
RISQ=R1*R1
RS=R1*PRAT
THETAC=ATAN(1./(FINE + FINE))
CONANG=THETAC*DPR
TN=CONANG
SREF = ZARZ(12) * 144.
ANUM = 4.
IF(IART.EQ.3) ANUM = 3.
XWTV = PANWT/ANUM
PNUM = 4.
IF(IARW.EQ.3) BNUM = 3.
IF(NW.EQ.2) BNUM = 2.
XWTW = PANWW/BNUM
THKRT = TRAT
THKRW = TRAW
THKRV = TRAVT
CMT = DCASE
CMNX=0.0
CMN=CMNX
IF(NAERO(5) .NE. 3 ) DMW=DCASE
C6 = DCASE
IF(NAERO(12).EQ.3) DMN = DMNX
XMF = XMSX
RL6 = AL5X
RL7A = ARL6
IF(ITN.LT.4) XLN=FINE*D1
IF ( J .EQ. 1 ) WRITE(6,INPUT)
IF(IBTL.EQ.0) GO TO 206
C.....BOATTAIL GEOMETRY
XBT=FRBT*D1
CB=DEOD+FACTOR*(DCASE-DEOD)
IF(XRT.GT.TNOZL+1.) XBT=TNOZL+1.
IF(CB.LT.DCASE) GO TO 205
CP=DCASE
GO TO 207

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AERM2550
AERM2560
AERM2570
AERM2580
AERM2590
AERM2600
AERM2610
AERM2620
AERM2630
AERM2640
AERM2650
AERM2660
AERM2670
AERM2680
AERM2690
AERM2700
AERM2710
AERM2720
AERM2730
AERM2740
AERM2750
AERM2760
AERM2770
AERM2780
AERM2790
AERM2800
AERM2810
AERM2820
AERM2830
AERM2840
AERM2850
AERM2860
AERM2870
AERM2880
AERM2890
AERM2900
AERM2910
AERM2920
AERM2930
AERM2940
AERM2950
AERM2960
AERM2970
AERM2980
AERM2990
AERM3000
AERM3010
AERM3020
AERM3030
AERM3040
AERM3050
AERM3060
AERM3070
AERM3080
AERM3090

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205	CONTINUE	AERM3100
	RL2=RL3-XBT	AERM3110
	TANBT=(DCASE-DR)*0.5/(RL3-RL2)	AERM3120
	IF(TANBT.GE.0.286) TANBT=0.286	AERM3130
C.....	MAXIMUM BOATTAIL ANGLE IS 10 DEG.....	AERM3140
	THETBT=ATAN((D1-DR)/(2.*XBT))	AERM3150
	XTHETBT=P1/TAN(THETBT)	AERM3160
	GO TO 207	AERM3170
206	CONTINUE	AERM3180
	THETBT=0.0	AERM3190
	XPT=0.0	AERM3200
	TANBT=0.0	AERM3210
	THETBT=0.0	AERM3220
	XTHETBT=0.0	AERM3230
	CP=D1	AERM3240
207	CONTINUE	AERM3250
	RL2=RL3-XBT	AERM3260
	IF(RL4.LE.RL2) DLE = D1	AERM3270
	IF(RHLT.LE.RL2) DMT = D1	AERM3280
	IF(RHLT.GT.RL2) DMT = D1-(TANBT*(RHLT-RL2))*2.	AERM3290
220	CONTINUE	AERM3300
	BTH = BT / 2. + DMT / 2.	AERM3310
	STED = STET/57.296	AERM3320
	SLET = ATAN(2.*(RCT+.5*PT*TAN(STED)-TC T)/BT)*57.296	AERM3330
	IF(IBTL.EQ.3) DLE = D1	AERM3340
	IF(NW.LE.0) GO TO 221	AERM3350
	BWH = BW/2. + DCASE/2.	AERM3360
	SWED = STEW/57.296	AERM3370
	SLEW = ATAN(2.*(RCW+.5*PW*TAN(SWED)-TCW)/BW)*57.296	AERM3380
221	CONTINUE	AERM3390
	IF(ITN.LE.3) GO TO 1111	AERM3400
	IF(ITN.EQ.4) GO TO 1211	AERM3410
	IF(ITN.EQ.5) GO TO 1311	AERM3420
	IF(ITN.EQ.6) GO TO 1411	AERM3430
1111	RL1A=RL1	AERM3440
	ROG=0.25*D1 + (RL1**2)/D1	AERM3450
	GO TO 1412	AERM3460
1211	RL1A=R1	AERM3470
	GO TO 1412	AERM3480
1311	RS=BRAT*R1	AERM3490
	RL1=D1/(2.0*TAN(THETAC))	AERM3500
	XCAP=RS*(1.0-SIN(THETAC))	AERM3510
	YCAP=RS*COS(THETAC)	AERM3520
	XNEG=YCAP/TAN(THETAC)	AERM3530
	RL1A=RL1-XNEG+XCAP	AERM3540
	XLNT=RL1	AERM3550
	XLERC=RL1-XNEG	AERM3560
	GO TO 1412	AERM3570
1411	ROG=0.25*D1 + (RL1**2)/D1	AERM3580
	RS=BRAT*R1	AERM3590
	RX=ROG-RS	AERM3600
	RX2=RX*RX	AERM3610
	RY=ROG-R1	AERM3620
	RY2=RY*RY	AERM3630
	RR=SQRT(PX2-RY2)	AERM3640

ANG=ARCCOS(RY/RX)	AERM3650
XCAPD=RS*(1.-SIN(ANG))	AERM3660
YCAPD=RS*COS(ANG)	AERM3670
PL1A=RR + RS	AERM3680
1412 CONTINUE	AERM3690
FAFN1=(RL3-RL1)/RL1A	AERM3700
CNOSE=RL1-RL1A	AERM3710
FCAP=RS/R1	AERM3720
IF(ITN.EQ.4) XLN=0.5*D1	AERM3730
IF(ITN.EQ.4) FCAP=1.0	AERM3740
IF(ITN.EQ.4) BRAT=1.0	AERM3750
IF(ITN.GE.4) CALL RL TGED	AERM3760
XCYL=RL3-RL1A-XBT-DNOSE	AERM3770
IF(ITN.EQ.1) GO TO 441C	AERM3780
IF(ITN.EQ.2) GO TO 416	AERM3790
IF(ITN.EQ.3) GO TO 401	AERM3800
IF(ITN.EQ.4) GO TO 402	AERM3810
IF(ITN.EQ.5) GO TO 415	AERM3820
IF(ITN.EQ.6) GO TO 4411	AERM3830
C*****COMPUTE VOLUME OF CONE*****	AERM3840
401 VOLC=0.25*PI*D1*D1*RL1 /3.0	AERM3850
VCLN=VOLC	AERM3860
GO TO 440	AERM3870
402 VOLS=2.*PI*R1**3/3.	AERM3880
VCLN=VOLS	AERM3890
GO TO 440	AERM3900
416 VOLVK=0.5*PI*R1*R1*RL1	AERM3910
VCLN=VOLVK	AERM3920
GO TO 440	AERM3930
415 VOLFC=((PI*D1*D1/12.0)/(XLNT**2))*(XLNT**3-XNEG**3)	AERM3940
VCLSP=PI*RS*RS*XCAP-0.3333*PI*XCAP**3	AERM3950
VCLBC=VOLSP+VOLFC	AERM3960
VCLN=VCLBC	AERM3970
GO TO 440	AERM3980
C*****COMPUTE VOLUME OF OGIVE NOSE FROM NOSE TANGENCY POINT TO CYLINDER	AERM3990
C TANGENCY POINT****	AERM4000
4411 XLN=RL1A	AERM4010
C***COMPUTE RADIUS OF OGIVE***	AERM4020
ROG=(R1**2+ XLN*(XLN-2.*RS))/(2.*R1-2.*RS)	AERM4030
ROG2=ROG*ROG	AERM4040
C****TANGENCY POINT OF SPHERE***	AERM4050
XTANP=XLN-RS + (RS*(XLN-RS))/(ROG-RS)	AERM4060
YTANP=(RS*(ROG-R1))/(ROG-RS)	AERM4070
XTANP2=XTANP*XTANP	AERM4080
XLNT=SQRT(D1*ROG-0.25*D1*D1)	AERM4090
PHIMAX=ARSIN(XLNT/ROG)	AERM4100
PHI=ARSIN(XTANP/ROG)	AERM4110
TERMA=SIN(PHI)*(2. + COS(PHI)**2)/3.	AERM4120
TERMB=COS(PHIMAX)*(SIN(PHI)*COS(PHI) + PHI)	AERM4130
TERMC=COS(PHIMAX)*COS(PHIMAX)*SIN(PHI)	AERM4140
VOLOGF=(PI*ROG**3)*(TERMA - TERMB + TERMC)	AERM4150
VCLSPH=PI*RS*RS*(XLN-XTANP)-0.333*PI*(XLN**3-XTANP**3)	AERM4160
VCLN=VCLN	AERM4170
GO TO 440	AERM4180
4410 XLNT=SQRT(D1*ROG-0.25*D1*D1)	AERM4190

FPNT=XLNT/D1	AERM4200
TERM1=1.-R1/ROG	AERM4210
TERM2=TERM1*TERM1	AERM4220
TERM3=XLNT/ROG	AERM4230
VOLN=PI*ROG**3*(TERM3*TERM2/3. + 2.*TERM3/3.	AERM4240
1-AR SIN(TERM3)*TERM1)	AERM4250
GO TO 440	AERM4260
C****COMPUTE CYLINDRICAL SECTION VOLUME****	AERM4270
440 VOLCYL=0.25*PI*D1*D1*XCYL	AERM4280
C****COMPUTE CONICAL BOATTAIL VOLUME****	AERM4290
IF(IRTL.EQ.0) GO TO 450	AERM4300
VOLBT=((PI*D1*D1/12.)/(XTHEBT**2))*((XTHEBT**3-(XTHEFT-XBT)**3)	AERM4310
GO TO 451	AERM4320
450 CONTINUE	AERM4330
VOLBT=0.0	AERM4340
451 VOLBCD=VOLN +VOLCYL + VOLBT	AERM4350
IF(NAERO(8).EQ.0) NAERO(8) = 1	AERM4360
IF(NAERO(9).EQ.0) NAERO(9) = 1	AERM4370
ITSECT = NAERO(10)	AERM4380
IWSECT = NAERO(11)	AERM4390
INTYPE = 0	AERM4400
IF(NAERO(12).EQ.1) INTYPE=21	AERM4410
IF(NAERO(12).EQ.2) INTYPE=22	AERM4420
IF(NAERO(12).EQ.3) INTYPE=11	AERM4430
IF(NAERO(12).EQ.4) INTYPE = 4	AERM4440
IF(NAERO(12).EQ.5) INTYPE = 5	AERM4450
ICONDU = NAERO(13)	AERM4460
ISZ = NAERO(14)	AERM4470
J = NAERO(15)	AERM4480
ICDON = NAERO(17)	AERM4490
IEPW = NAERO(26)	AERM4500
IBTLC = NAERO(22)	AERM4510
ICONP = NAERO(21)	AERM4520
ICLTN = NAERO(20)	AERM4530
ICLTF = NAERO(19)	AERM4540
ICDOF = NAERO(18)	AERM4550
C	AERM4560
C	AERM4570
C*****PFCIN ALTITUDE LOOP	AERM4580
C	AERM4590
ISWT=-1	AERM4600
ILIM=0	AERM4610
77 CONTINUE	AERM4620
IF (KSTEP .NE. 2) GO TO 1174	AERM4630
DO 1173 IJ = 1, NPM	AERM4640
XZML1(IJ)=RMV(IJ)	AERM4650
XZML2(IJ)=RMV(IJ)	AERM4660
XZMD1(IJ)=RMV(IJ)	AERM4670
XZMD2(IJ)=RMV(IJ)	AERM4680
1173 CONTINUE	AERM4690
1174 CONTINUE	AERM4700
IF (KSTEP .GT. 2) GO TO 699	AERM4710
1183 CONTINUE	AERM4720
IF (J .EQ. 0) GO TO 9021	AERM4730
9021 CONTINUE	AERM4740

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DO 100 KK = 1, NALT
KKR(LN)=KK
IALT=KK
COEFFD(1, KK) = ALTV(KK)
COEFFDF(1, KK) = ALTV(KK)
ALT=ALTV(KK)
ALT = ALT / 1000.

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C
C*****BEGIN MACH NUMBER LOOP
C

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DO 200 JJ=1,NRM
JJRUN = JJ
ALPHA = 0.
ALPHAR = 0.
ANETDA = 0.
ACNAAW = 0.
ACLTWV = 0.
ADCNW = 0.
ACNWE = 0.
ACNVW = 0.
ACLWV = 0.
ACLWR = 0.
ACLBW = 0.
ACLW = 0.
CLAT = C.
CNA = 0.
CN = 0.
CMAR = 0.
CMAT = 0.
CMAW = 0.
CMA = 0.
CDBCLT = 0.0
IF(ISWT.LT.0) RM=RMV(JJ)
PATS = 2116.6-76.3568*ALT+1.08896*ALT**2-7.1106E-3*ALT**3+
1 1.7613E-5*ALT**4
QRATIO = 1.
CYNP=0.7*PATS*RM**2
IF(NAERO(12).GT.3) PL = 1.
IF(NAERO(12).GT.3) XML = RM
IF(NAERO(5).NE.3) GO TO 335
QRATIO = PL/DYNP
IF(QRATIO.EQ.0.) QRATIO = 1.
335 CONTINUE
NFIVE = NAERO(5)
IF(NAERO(5).EQ.3) NAERO(5) = 2
ISNTRL = ICNTRL
IF(ICNTRL.EQ.3) ICNTRL = 2
XMACH = RM
340 SREF=0.25*P[*01**2
PA=SREF
ITRIP = 2
IF(RM.LE..9) ITRIP = -1
IF(RM.EQ.1.) ITRIP = 0
IF(RM.GE.1.2) ITRIP = 1
ALPHA0 = 0.

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AERM4750
AERM4760
AERM4770
AERM4780
AERM4790
AERM4800
AERM4810
AERM4820
AERM4830
AERM4840
AERM4850
AERM4860
AERM4870
AERM4880
AERM4890
AERM4900
AERM4910
AERM4920
AERM4930
AERM4940
AERM4950
AERM4960
AERM4970
AERM4980
AERM4990
AERM5000
AERM5010
AERM5020
AERM5030
AERM5040
AERM5050
AERM5060
AERM5070
AERM5080
AERM5090
AERM5100
AERM5110
AERM5120
AERM5130
AERM5140
AERM5150
AERM5160
AERM5170
AERM5180
AERM5190
AERM5200
AERM5210
AERM5220
AERM5230
AERM5240
AERM5250
AERM5260
AERM5270
AERM5280
AERM5290

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IF(J.EQ.1) WRITE(6,1876) RM, ALPHA0, ALT
FR=RL1/D1
FRB = (RL3 - (PL1 - RL1A))/D1
CML=RM/FR
DHL = DMT
IF(ICNTRL.EQ.2) DHL = DMW
RLD=XRT/D1
I = 1
IF(J.EQ.1) WRITE(6,1) I, Q1(1), Q(7), SREF, Q(13), FR
1 Q(21), FRB, Q(1), DML, Q(92), DHL, Q(2), PLD
RLDB = 0.
PETA = SQRT(ABS(RM**2-1.))
IF(RM.GE.1.1) RLDB=2.*RLD/BETA
IF((RM.GE.1.1).OR.(RM.LE.1.0)) GO TO 343
BETA = SQRT(ABS(1.1**2 - 1.))
RLDB = 2.*RLD/BETA
343 CONTINUE
FA = (RL3-RL1)/D1
TA = RL3 / 120.
C=CR+DA+DA
CD=DR/DCASE
I = 2
IF(J.EQ.1) WRITE(6,1) I, Q1(1), Q(57), RLDB, Q(5), BETA
1 Q(93), FA, Q(10), DA, Q(14), D, Q(3), DD
DD2 = DD**2
DD12 = (D/D1) **2
FAFN = FA/FR
BFN = BETA/FR
I = 3
IF(J.EQ.1) WRITE(6,1) I, Q1(1), Q(4), DD2, Q(9), DD12,
1 Q(94), FAFN, Q(95), BFN
C
C***** TAIL VARIABLES *****
C
C***** LEADING EDGE SWEEP CAN NEVER BE LESS THAN 0.1 DEGREE *****
SVAL = SLET
IF(SLET.EQ.0.0) SVAL = 0.1
SLETR = SVAL/OPR
TANST = TAN(SLETR)
STETR = STET/OPR
TANOT = TAN(STETR)
TANS2T = (RCT-TCT)/RT + TANOT
TANS4T = 1.5*(RCT-TCT)/BT + TANOT
ACT = (TCT+RCT)/2.
IF ( IART .EQ. 1 ) RNT = 2.
ST = RNT*ACT*BT/2.
I = 4
IF(J.EQ.1) WRITE(6,1) I, Q1(1), Q2(3), SLETR, Q2(4), TANST, Q2(5),
1 TANS2T, Q2(6), TANS4T, Q2(9), ACT, Q2(10), ST
STSREF = ST/SREF
SET = 2.*ST/RNT
STAIL = SET/2.0
BART = PETA*ART
I = 5
IF(J.EQ.1) WRITE(6,1) I, Q1(1), Q2(15), ART, Q2(16), BART, Q2(11),

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1 STSREF, Q2(17), THKRT, Q2(13), RXINT, Q2(14), SET	AFRM5850
ATNS2T = ART*TANS2T	AFRM5860
ATNS4T = ART*TANS4T	AFRM5870
ATCT = ART*THKRT	AFRM5880
AMACT = .6666*(RCT+TCT-RCT*TCT/(RCT+TCT))	AFRM5890
TMACT = THKRT*RCT/AMACT	AFRM5900
ATCT = ART*TMACT	AERM5910
350 CONTINUE	AFRM5920
PTANST = BETA/TANST	AFRM5930
ECCT = BETA*DMT/RCT	AFRM5940
TRT = TCT/RCT	AFRM5950
TRTP1 = 1.+TRT	AFRM5960
I = 6	AFRM5970
IF(J.EQ.1) WRITE(6,1) I, Q1(1), Q2(7), ATNS2T, Q2(8), ATNS4T,	AFRM5980
1 Q2(18), BTANST, Q2(19), BDCT, Q2(20), TRTP1	AFRM5990
BAPPT = .25*ART*TRTP1*TANST	AFRM6000
BAPT = 0.	AFRM6010
IF(RM.NE.1) BAPT = BART*TRTP1*(1.+1./BTANST)	AERM6020
I = 7	AERM6030
IF(J.EQ.1) WRITE(6,1) I, Q1(1), Q2(22), BAPT, Q2(21), BAPPT, Q(43)	AFRM6040
1, TRT, Q2(18), BTANST	AERM6050
FLTSFT = FSOVCT*RCT	AFRM6060
XLENT = RXINT*RCT	AFRM6070
BTANST = 0.	AERM6080
ALSRT = 0.	AFRM6090
ALSRW = 0.	AFRM6100
CNAST = 0.	AERM6110
ALPT = 0.	AFRM6120
ALPW = 0.	AERM6130
ACE = 0.	AFRM6140
SWEPSR = 0.	AFRM6150
IF (RM.LE.1.) GO TO 410	AFRM6160
IF (BTANST.LE.1.) GO TO 410	AFRM6170
IF (NAEPD(8).EQ.2) GO TO 410	AFRM6180
410 IF (NW.NE.1) GO TO 480	AERM6190
C	AFRM6200
C***** WING VARIABLES *****	AFRM6210
C	AFRM6220
C***** LEADING EDGE SWEEP CAN NEVER BE LESS THAN 0.1 DEGREE *****	AFRM6230
IF(IART.NE.1) GO TO 9887	AERM6240
SVTSRF=SVT/SREF	AFRM6250
PARVT=BETA*ARVT	AFRM6260
TANOVTV=TAN(STEVTR)	AERM6270
TAN2VT=0.5*(RCVT - TCVT)/BVT + TANOVTV	AFRM6280
TAN4VT=0.75*(RCVT - TCVT)/BVT + TANOVTV	AFRM6290
ACVT=(TCVT + RCVT)/2.	AERM6300
ATN2VT=ARVT*TAN2VT	AFRM6310
ATN4VT=ARVT*TAN4VT	AERM6320
ATCVT=ARVT*THKRT	AFRM6330
AMACVT=0.6666*(RCVT + TCVT - RCVT*TCVT/(RCVT+TCVT))	AFRM6340
TMACVT=THKRT*RCVT/AMACVT	AERM6350
ATCVT=ARVT*TMACVT	AERM6360
BTANVT=BETA/TANST	AERM6370
ECCT=BETA*DMT/RCVT	AFRM6380
TRTPV1=1.0 + TRVT	AERM6390

BAPPVT=0.25*ARVT*TRTPV1*TANSVT	AERM6400
BAPVT=0.0	AERM6410
IF(RM.NE.1.)BAPVT=BAPVT*TRTPV1*(1.+1./BTANVT)	AERM6420
FLVTST=FSQVVT*RCVT	AERM6430
XLENVT=RXINVT*RCVT	AERM6440
9887 CONTINUE	AERM6450
SVAL = SLFW	AERM6460
IF(SLEW.EQ.C.0) SVAL = 0.1	AERM6470
SLEWR = SVAL/DPP	AERM6480
TANSW = TAN(SLEWR)	AERM6490
STFW = STEW/DPR	AERM6500
TANOW = TAN(STFW)	AERM6510
TANS2W = (RCW-TCW)/RW + TANOW	AERM6520
TANS4W = 1.5*(RCW-TCW)/RW + TANOW	AERM6530
I = 8	AERM6540
IF(J.EQ.1) WRITE(6,1) I, Q1(1), Q2(21), BAPPT, Q2(22), BAPT,	AERM6550
1 Q2(23), SLEWR, Q2(24), TANSW, Q2(25), TANS2W, Q2(26), TANS4W	AERM6560
ACW = (TCW+RCW)/2.	AERM6570
SW = RNW*ACW*BW/2.	AERM6580
SWSREF = SW/SPEF	AERM6590
SFW = 2.*SW/RNW	AERM6600
SWING = SFW/2.0	AERM6610
I = 9	AERM6620
IF(J.EQ.1) WRITE(6,1) I, Q1(1), Q2(33), RXINW, Q2(34), SFW,	AERM6630
1 Q2(29), ACW, Q2(30), SW, Q2(31), SWSREF, Q2(37), THKRW	AERM6640
C	AERM6650
411 BARW = BETA*ARW	AERM6660
ATNS2W = ARW*TANS2W	AERM6670
ATNS4W = ARW*TANS4W	AERM6680
ATCW = ARW*THKRW	AERM6690
AMACW = .6666*(RCW+TCW-RCW*TCW/(RCW+TCW))	AERM6700
TMACW = THKRW*RCW/AMACW	AERM6710
ATCW = ARW*TMACW	AERM6720
420 CONTINUE	AERM6730
BTANSW = BETA/TANSW	AERM6740
I = 10	AERM6750
IF(J.EQ.1) WRITE(6,1) I, Q1(1), Q2(27), ATNS2W, Q2(28), ATNS4W,	AERM6760
1 Q2(35), ARW, Q2(36), BARW, Q2(38), BTANSW	AERM6770
BDCW = BETA*DMW/RCW	AERM6780
TRW = TCW/RCW	AERM6790
TRWP1 = 1.+TRW	AERM6800
BAPPW = .25*ARW*TRWP1*TANSW	AERM6810
BAPW = 0.	AERM6820
IF(RM.NE.1) BAPW = BARW*TRWP1*(1.+1./BTANSW)	AERM6830
I = 11	AERM6840
IF(J.EQ.1) WRITE(6,1) I, Q1(1), Q2(39), BDCW, Q2(40), TRWP1,	AERM6850
1 Q2(41), BAPPW, Q2(42), BAPW, Q(43), TRT, Q(47), TRW	AERM6860
FLTSEW = FSQVCW*RCW	AERM6870
XLENW = RXINW*RCW	AERM6880
ALSRW = 0.	AERM6890
CNASW = 0.	AERM6900
ALPW = 0.	AERM6910
IF (RM.LE.1.) GO TO 480	AERM6920
IF (BTANSW.LE.1.) GO TO 480	AERM6930
IF (NAERO(9).EQ.2) GO TO 480	AERM6940

480	CONTINUE	AERM6950
C		AERM6960
	CALL DRAG (ALT, RM, KSTEP, CDOB, CDOS)	AERM6970
	CALL LIFT(RM,CNA,KSTEP)	AERM6980
	IF (KSTEP .EQ. 1) CDOB = 0.0	AERM6990
	PRAMPL(128) = CNA	AERM7000
	IF(ISWT) 920,770,775	AERM7010
920	CONTINUE	AERM7020
	COEFM(JJ)=CMA	AERM7030
	COEFX(JJ)=XD1	AERM7040
	COEFQ(JJ) = CNA / DPR	AERM7050
	COEFL(JJ)=CNA / DPR	AERM7060
	IF (KINDB .EQ. 3) COEFL(JJ) = COEFL(JJ) + CLALPE	AERM7070
	JJJJ = JJ + 1	AERM7080
	COEFD(JJJJ,KK) = CDOS	AERM7090
	COEFD(JJJJ,KK) = CDOB	AERM7100
	DZERO=CDOSN*DYNP*SREF/144.	AERM7110
C*****	REGIN ALPHA LOOP*****	AERM7120
	NALPHA = 1	AERM7130
	ALPHAV(1) = 0.0	AERM7140
	DO 2000 LL=1,NALPHA	AERM7150
	ALPHAR=ALPHAV(LL)/57.3	AERM7160
	CL=CNA*ALPHAR	AERM7170
	DT=CL*TAN(ALPHAR)*DYNP*SREF/144.	AERM7180
	DTOT=DZERO + DT	AERM7190
	VLIFT=CL*DYNP*SREF/144.	AERM7200
	ALD=VLIFT/DTOT	AERM7210
	AMLF=VLIFT/WMISS	AERM7220
	IF (J .EQ. 1) WRITE(6,FCRCS)	AERM7230
2000	CONTINUE	AERM7240
200	CONTINUE	AERM7250
	IF (J .EQ. 0) GO TO 9160	AERM7260
	CALL PAGE	AERM7270
9158	FORMAT(///)	AERM7280
	WRITE(6,9158)	AERM7290
	WRITE(6,9150)	AERM7300
9150	FORMAT(17X3PALT, 6X4HPACH, 2X 8HCDO-SUST, 1X9HCDO-BOOST,	AERM7310
	1 7X3HCLA //)	AERM7320
9156	FORMAT(10X,F10.0)	AERM7330
9157	FORMAT(20X,F10.2, 3F10.3)	AERM7340
	WRITE(6, 9156) ALTV(KK)	AERM7350
	DO 9350 ISAX= 1, NRM	AERM7360
	ISA = ISAX + 1	AERM7370
	WRITE(6,9157) RMV(ISAX),COEFD(ISA,KK), COEFD(ISA,KK), COEFQ(ISA)	AERM7380
9350	CONTINUE	AERM7390
9160	CONTINUE	AERM7400
100	CONTINUE	AERM7410
659	CONTINUE	AERM7420
	IF (KSTEP .LT. 3) GO TO 1184	AERM7430
	RMLD = 0.8	AERM7440
	RM=RMLD	AERM7450
	ISWT=0	AERM7460
	GO TO 1183	AERM7470
770	IF(ILIM.NF.0) GO TO 771	AERM7480
	CCPDX=XD11 - XD1	AERM7490


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      DCGDX=WWING/WMISS
771  SMLD=XCGD1 -XD1
      IF (ILIM.NE.0) GO TO 772
      IF ((SMRL-SMLD).GE.-.1) GO TO 5000
      DELXW=(SMRL-SMLD)/(DCGDX-DCPDX)
      GO TO 5010
5000  DFLXW=0.0
5010  XLEW= PL5 + DELXW*D1
772  WRITE(6,WINLOC)
      RMHI=2.0
      PM=PMHI
      ISWT=1
      GO TO 77
775  IF (ILIM.NE.0) GO TO 6800
      DCPDX=XD11-XD1
      XD2=XD1 + DELXW*DCPDX
      XCGD1=XCGD1 + DCGDX*DELXW
776  SMHI=XCGD1- XD2
      IF (ILIM.NE.0) GO TO 6800
      IF ((SMPT-SMHI).GE.-.1) GO TO 6600
      DELXW=(SMRH-SMHI)/(DCGDX-DCPDX)
      GO TO 6010
6600  DFLXW=0.0
6010  XLEW=XLEW + DELXW*D1
      XLEWL=0.0
      IF ((RCW + XLEW).GT.(TLTHEO-RCR-6.)) GO TO 6700
      GO TO 6800
6700  XLEWL=TLTHEO-RCR-6.0-RCW
      DFLXW=XLEWL-XLEW
      XLEW=XLEWL
      XCGD1=XCGD1 + DELXW*DCGDX/D1
      XD1=XD1 + DELXW*DCPDX
      ILIM=1
      XD2=XD2 + DELXW*DCPDX/D1
      SMHI=XCGD1-XD2
      GO TO 699
6800  CONTINUE
      IF ( J .NE. 1 ) GO TO 400
      WRITE(6,WINLOC)
      IF (ILIM.EQ.1) WRITE(6,5000)
9000  FORMAT(10X,23H MOST AFT WING LOCATION      )
      WRITE (6,9001) XLEW
9001  FORMAT ( 10X17HWING LOCATION AT      , F6.2, 4H IN.  )
1184  CONTINUE
      IF ( J .NE. 1 ) GO TO 400
      CALL WRTOU('MACH NUM',RMV,20,1,1,NRM,1,1)
      CALL WRTOU('ALT-KFT.',ALTV,10,1,1,NALT,1,1)
      CALL WRTOU('ALPHA ',ALPHAV,10,1,1,NALPHA,1,1)
      CALL WRTOU('CDO-PON ',COEFD,20,5,1,NRM,NALT,1)
      CALL WRTOU('CDO-POFF',COEFD,20,5,1,NRM,NALT,1)
      CALL WRTOU('CLALPHA ',COEFL,20,1,1,NRM,1,1)
      CALL WRTOU('CMALPHA ',COEFM,20,1,1,NRM,1,1)
      CALL WRTOU('CPLLOC ',COEFX,20,1,1,NRM,1,1)
      CALL WRTOU('CMQ      ',COEFQ,20,1,1,NRM,1,1)
400  CONTINUE

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AERM7500
AERM7510
AERM7520
AERM7530
AERM7540
AERM7550
AERM7560
AERM7570
AERM7580
AERM7590
AERM7600
AERM7610
AERM7620
AERM7630
AERM7640
AERM7650
AERM7660
AERM7670
AERM7680
AERM7690
AERM7700
AERM7710
AERM7720
AERM7730
AERM7740
AERM7750
AERM7760
AERM7770
AERM7780
AERM7790
AERM7800
AERM7810
AERM7820
AERM7830
AERM7840
AERM7850
AERM7860
AERM7870
AERM7880
AERM7890
AERM7900
AERM7910
AERM7920
AERM7930
AERM7940
AERM7950
AERM7960
AERM7970
AERM7980
AERM7990
AERM8000
AERM8010
AERM8020
AERM8030
AERM8040

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RL5 = RL5SAV
 RETURN
 END

AERM8050
 AERM8060
 AERM8070

C SUBROUTINE DRAG(ALT,PM,KSTEP,CDOB,CDO5)
 PGM=NUK.CMCGSM GGJ/RKM FIV/EBCD 9/10/73
 DOUBLE PRECISION Q,Q1,Q2,A1,A2,ZZT,CVV,CVVT,CVVW
 DIMENSION COEFF(20,5)
 DIMENSION BASEP(20)
 DIMENSION RMV(20),ALTV(10),ALPHAV(10),NAERO(30)
 COMMON /BOAT/ CDLUMP,CDPRTL,DUM18(18)
 COMMON/AERO/
 1 ATNS4T ,ATNS4W ,BTANA ,BART ,BARW ,BAPT ,
 2 RAPW ,RAPPT ,BAPPW ,BETA ,BFN ,CFT ,
 3 CFW ,CDR ,CFB ,CNANAC ,CLABT ,CLAT ,
 4 CLAW ,CLTV ,CKWB ,CKBW ,CKBT ,CKTB ,
 5 CLATWV ,D ,DD ,DD2 ,DPR ,DHL ,
 6 FAEN ,F ,FL ,FR ,PI ,RLD ,
 7 RLDB ,RBTANA ,SLETR ,SLEWR ,STSREF ,SWSREF ,
 8 SKBT ,SKTB ,SKBW ,SKWB ,TRTP1 ,TRWP1 ,
 9 CFI ,TANST ,TANSW ,TANS4T ,TANS4W ,TANS2T ,
 A TANS2W ,XD1B ,XD1BT ,XD1T ,XD1W ,XNLCMP ,
 B XNLCDR ,ACT ,ACW ,XNLCLB ,BODYL ,TAILL ,
 C WINGL ,RLISQR ,DISQR ,FRI ,FCAP ,CDPNX ,
 D ACAP ,TN1 ,SPN ,VPN ,FAFN1 ,PMN ,
 E ANOSE2 ,SWSRN ,RNOSE2 ,XLINF ,CR2 ,NCCN(3) ,
 F CRFMAX ,CRAMAX ,BZ ,CNVR ,BI ,BZ ,
 G SV2 ,SLEI ,SLEZ ,XVA ,XVB ,XVC ,
 H CT2 ,CX ,VOLN ,VOLBT ,VOLBOD ,SWREF ,
 I BRAT ,ROG
 COMMON/AERZ/ CDOB,CDO5,CDO7,CDOON,CDOOFF,CDBCN,CDBCFE,CDOXX ,ITRIP,
 1FRBT,FRB
 2 , NAERO
 EQUIVALENCE (NAERO(3), ILUG)
 COMMON /AFTAR/ ARVT,AFT13(13)
 EQUIVALENCE (AFT13(5), TANSVT)
 EQUIVALENCE (AFT13(3), RCVT)
 COMMON/ARINDX/ JJ,ARIN(9)
 COMMON/BASDRG/ BASEP(59)
 COMMON/BDTAR/ NCONF,NPRX,NRMX,NCONFEX,NPRXX,NRMXX
 COMMON/BLKQ/ Q1(20),Q(96),Q2(96), FRCTN1(42),FRCTN2(90)
 1 ,FRCTN3(42)
 COMMON/COEXX/ KIND,ITYPE,ZIGY(14)
 COMMON/DRG/
 1 D1 ,THETAC ,FINE ,RS ,R1 ,RL1 ,
 2 XCYL ,XTHEBT ,XBT ,RL3 ,ITN ,AMACW ,
 3 AMACT ,THKRT ,THKRW ,RL1A ,IBTL ,ATCT ,
 4 ATCW ,DML ,ITSECT ,IWSECT ,RXINT ,RXINW ,
 5 BTANST ,BTANSW ,RCW ,FLTSEW ,XLENW ,FLTSET ,
 6 XLFNT ,QRATIO ,DN ,DE ,D3 ,RCT ,
 7 NW ,TCW ,TCT ,BT ,BW ,ART ,
 8 APW ,TRT ,TRW ,SREF ,DB
 COMMON /EXTERN/ ZARZ(20)

DRAG0010
 DRAG0020
 DRAG0030
 DRAG0040
 DRAG0050
 DRAG0060
 DRAG0070
 DRAG0080
 DRAG0090
 DRAG0100
 DRAG0110
 DRAG0120
 DRAG0130
 DRAG0140
 DRAG0150
 DRAG0160
 DRAG0170
 DRAG0180
 DRAG0190
 DRAG0200
 DRAG0210
 DRAG0220
 DRAG0230
 DRAG0240
 DRAG0250
 DRAG0260
 DRAG0270
 DRAG0280
 DRAG0290
 DRAG0300
 DRAG0310
 DRAG0320
 DRAG0330
 DRAG0340
 DRAG0350
 DRAG0360
 DRAG0370
 DRAG0380
 DRAG0390
 DRAG0400
 DRAG0410
 DRAG0420
 DRAG0430
 DRAG0440
 DRAG0450
 DRAG0460
 DRAG0470
 DRAG0480
 DRAG0490

COMMON/GOBOL/ WARD(78)	DRAG0500
EQUIVALENCE (WARD(73),TR), (WARD(74), TB)	DRAG0510
COMMON/INDATA/ CCOI, CLALF,WEIGHT	DRAG0520
COMMON/INDATX/ ZAP(23)	DRAG0530
COMMON/INSERT/ INS19(19), RBE, INS10(10), TBL, INS2(2)	DRAG0540
COMMON /LEFT/ XLFT10(10), IART, XLF3(3)	DRAG0550
COMMON/NAERC/ NAZ6(6), DCASE, NAZ18(18)	DRAG0560
COMMON/OUTPI/ OUTP(15), OUTDUM(20)	DRAG0570
EQUIVALENCE (OUTP(1), CDSKIN)	DRAG0580
EQUIVALENCE (OUTP(2), CDPDIV), (OUTP(3), CDCOWL),	DRAG0590
1 (OUTP(5), CDPDIV), (OUTP(6), CDPFWD)	DRAG0600
EQUIVALENCE (OUTP(4), CDPAPT)	DRAG0610
EQUIVALENCE (OUTP(15), CDPFWD)	DRAG0620
COMMON/RJDAT/ RJC4(4),ACA3,RJD2(2), XLBST,FIZLX	DRAG0630
COMMON/SAVTIM/ KCLA,SAVT(5)	DRAG0640
COMMON/SUMOUT/ BODCD(20), XINGCD(20), WNGCD(20), TAILCD(20),	DRAG0650
1 TAXLCD(20), FRICCD(20), CDOONA(20), CDOOFA(20), CDPNAR(20),	DRAG0660
2 CDFXR1(20), CDFXR2(20), CDBTAR(20), CDLAR(20), BDRGN(20),	DRAG0670
3 CDPBOD(20), PLDVAR(20), CDCWL(20), FRGCD(20), CDPINX(20),	DRAG0680
4 CDPINT(20), CDPWAR(20), CDHTAR(20), CDVTAR(20), CDTLAR(20),	DRAG0690
5 CDPLSA(20), BDROFF(20), CDPTAR(20), CDPDFA(20)	DRAG0700
COMMON/TOVPER/ DUM(5), SEXIT,DUMX(5), ZA(4), EXTRA(57)	DRAG0710
EQUIVALENCE (DUM(4), BEXIT)	DRAG0720
COMMON/VERT/ SVTSRF, BARVT, TANOVT, TAN2VT, TAN4VT,	DRAG0730
1 ACVT, ATN2VT, ATCVT, AMACVT, TMACVT, BTANVT,	DRAG0740
2 BDCVT, TRTPV1, BAPPVT, BAPVT, FLVTST, XLENVT,	DRAG0750
3 CFVT, TRAVT, RXINVT, FSOVVT	DRAG0760
EQUIVALENCE (THKRV, TRAVT)	DRAG0770
COMMON/ZZZ/CDP51(20),CDP50(20),CDP53(28),CDNOG(58),CDNCO(58),	DRAG0780
1CDPN5(44),CDPM1(52),CDNVK(58),CDABT6(430),FLRM7(22),CDP70(228),	DRAG0790
2CDP71(228),CDSPHR(30)	DRAG0800
NAMLIST/BUG/CDPN,CDPRTL,CFB,CDL,CDOB,CDPW,CFW,COW,	DRAG0810
1CDPT,CFT,CDOCT,CDBOFF,CDBCN,CDOON,CDOOFF	DRAG0820
NAMLIST /NAMVER/ CDOVT, CDPVT,	DRAG0830
1 SVTSRF, BARVT, TANOVT, TAN2VT, TAN4VT,	DRAG0840
1 ACVT, ATN2VT, ATCVT, AMACVT, TMACVT, BTANVT,	DRAG0850
2 BDCVT, TRTPV1, BAPPVT, BAPVT, FLVTST, XLENVT,	DRAG0860
3 CFVT, TRAVT, RXINVT, FSOVVT	DRAG0870
NAMLIST/DNG/THKRW,THKRT,STSREF,SWSREF,ITSECT,IWSECT	DRAG0880
122 FORMAT(//I3, 2X, 6H AERO, 2H, ,	DRAG0890
1 6H CDPN, 2H =, E10.3, 2H, , 6HCDPRTL, 2H =, E10.3, 2H, ,	DRAG0900
2 6H CFB, 2H =, E10.3, 2H, , 6H CDL, 2H =, E10.3, 2H, ,	DRAG0910
3 6H CDOB, 2H =, E10.3)	DRAG0920
123 FORMAT(//I3, 2X, 6H AERO, 2H, ,	DRAG0930
1 6H CDWM2, 2H =, E10.3, 2H, , 6H CDA, 2H =, E10.3, 2H, ,	DRAG0940
2 6H ALSRT, 2H =, E10.3, 2H, , 6H ALPT, 2H =, E10.3, 2H, ,	DRAG0950
3 6H CNAST, 2H =, E10.3)	DRAG0960
124 FORMAT(//I3, 2X, 6H AERO, 2H, ,	DRAG0970
1 6H TN, 2H =, E10.3, 2H, , 6HCDPRTL, 2H =, E10.3, 2H, ,	DRAG0980
2 6H CDPT1, 2H =, E10.3, 2H, , 6H CDPW1, 2H =, E10.3, 2H, ,	DRAG0990
3 9H THCBT =,E10.3)	DRAG1000
125 FORMAT(//I3, 2X, 6H AERO, 2H, ,	DRAG1010
1 6H CDPW, 2H =, E10.3, 2H, , 6H CFW, 2H =, E10.3, 2H, ,	DRAG1020
2 6H COW, 2H =, E10.3, 2H, , 6H CDPT, 2H =, E10.3, 2H, ,	DRAG1030
3 6H CFT, 2H =, E10.3, 2H, , 6H CDOCT, 2H =, E10.3)	DRAG1040


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126 FORMAT(/I3, 2X, 6H AERO, 2H, , DRAG1050
1 6HCDROFF, 2H =, E10.3, 2H, , 6H CDRON, 2H =, E10.3, 2H, , DRAG1060
2 6H CDOI, 2H =, E10.3, 2H, , 6H CDOON, 2H =, E10.3, 2H, , DRAG1070
3 6HCCDOFF, 2H =, E10.3) DRAG1080
DATA BASECP/ DRAG1090
1 0.0, -.137, 0.8, -.137, 0.9, -.145, 1.0, -.195, 1.2, -.191, DRAG1100
1 1.5, -.172, 2.0, -.141, 3.0, -.092, 4.0, -.065, 5.0, -.048/ DRAG1110
POLY (X,CO,C1,C2,C3) = X * (X*(C3*X + C2) + C1) + CO DRAG1120
C TAKE OUT LATER DRAG1130
JJ = 1 DRAG1140
XMINT=ITYPE DRAG1150
J = NAERO(15) DRAG1160
IF ( IART .EQ. 1 ) ATN4VT = ARVT * TAN4VT DRAG1170
IF ( J .EQ. 1 ) WRITE(6,DOG) DRAG1180
C***** FRICTION DRAG *** ALL MACH NUMBERS ***** DRAG1190
C CALL FRCTN(ALT,FCFB,FCFT,FCFW,SWEPSR,RM) DRAG1200
CALL FRCTN(ALT,FCFB,FCFT,FCFW,SWEPSR,RM) DRAG1210
CDPRD = 0. DRAG1220
FL = 0. DRAG1230
CDA = 0. DRAG1240
CDPRTL = 0. DRAG1250
CDPT = 0. DRAG1260
CCPW = 0. DRAG1270
CDPRTL = 0. DRAG1280
CDPW1 = 0. DRAG1290
CFI = 0. DRAG1300
CDPVT=0.0 DRAG1310
CCPV1=0.0 DRAG1320
RDCD(JJ)=CFR DRAG1330
WNGCD(JJ)=CFW DRAG1340
TAILCD(JJ)=CFT DRAG1350
TAXLCD(JJ)=CFTT DRAG1360
400 CONTINUE DRAG1370
IF(ITN.EQ.3) TN = ATAN(1./(FR+FR))*DPR DRAG1380
IF(ITN.LE.2.OR.ITN.GT.3) TN = ASIN(FR/(.25+FR*FR))*DPR DRAG1390
IF(ITRIP) 500, 510, 610 DRAG1400
C DRAG1410
C***** DRAG CALCULATIONS FOR M.LE.0.9 ***** DRAG1420
C DRAG1430
500 IF(ITN.EQ.4) GO TO 501 DRAG1440
CDPN = CFB*(1.5/FRB**1.5+7./FRB**3) DRAG1450
GO TO 502 DRAG1460
501 CALL LINE(15,RM,CDSPHR(1),CDPN) DRAG1470
502 CDOT = CFT*(1.+2.*THKRT+100.*THKRT**4) DRAG1480
CDOVT=CFVT*(1.0 + 2.0*THKRT + 100.0*THKRT**4) DRAG1490
IF ( IART .NE. 1 ) CDOVT = 0. DRAG1500
CDPVT=CDOVT-CFVT DRAG1510
IF ( IART .NE. 1 ) CDPVT = 0. DRAG1520
506 IF(NW.EQ.1) CDOW = CFW*(1.+2.*THKRW+100.*THKRW**4) DRAG1530
CDPT = CDOT-CFT DRAG1540
IF(NW.EQ.1) CDPW = CDOW-CFW DRAG1550
508 GO TO 850 DRAG1560
C DRAG1570
C***** DRAG CALCULATIONS FOR M = 1.0 ***** DRAG1580
C DRAG1590

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510 IF(ITN.GT.4) GO TO 540	DRAG1600
IF(ITN.EQ.4) GO TO 545	DRAG1610
IF(ITN.FQ.3) GO TO 520	DRAG1620
CALL LINE(10,TN,CDP50(1),CDPN)	DRAG1630
GO TO 550	DRAG1640
520 CALL LINE(10,TN,CDP51(1),CDPN)	DRAG1650
GO TO 550	DRAG1660
540 CONTINUE	DRAG1670
FR1=RL1A/D1	DRAG1680
CDPN = FR1*(FR1*(-.0021*FR1 + .038) - .210) + .408	DRAG1690
GO TO 550	DRAG1700
545 CALL LINE(15,RM,CDSPHR(1),CDPN)	DRAG1710
550 CONTINUE	DRAG1720
THCRT = 0.0	DRAG1730
IF (IRTL.NE.C) THCRT = ATAN((1.-DD)/(RLD+RLD))	DRAG1740
IF (IRTL.FQ.C) GO TO 580	DRAG1750
IF (IRTL.NE.C) GO TO 560	DRAG1760
560 NPTS = 14	DRAG1770
570 CALL LINE(NPTS, DD2,CDP53(1),CDPBT1)	DRAG1780
CDPRTL = 0.0	DRAG1790
IF (THCRT .LE. 0.0) GO TO 580	DRAG1800
CDPRTL = (CDPBT1*8.0)/(RLD*RLD*THCRT*DPR)	DRAG1810
580 IF(ILUG.FQ.1) FL = 18.6	DRAG1820
IF(NAERO(8).EQ.1) GO TO 590	DRAG1830
585 CONTINUE	DRAG1840
590 CALL LINE(26, ATNS4T,CDPM1(1), CDPT1)	DRAG1850
CDPT = CDPT1*ATCT*STSREF	DRAG1860
IF(IART.NE.1) GO TO 593	DRAG1870
CALL LINE(26,ATN4VT,CDPM1(1),CDPV1)	DRAG1880
CDPVT =CDPV1*ATCVT*SVTSRF	DRAG1890
593 IF(NAERO(9).FQ.1) GO TO 594	DRAG1900
586 CONTINUE	DRAG1910
594 IF(NW.FQ.0) GO TO 600	DRAG1920
CALL LINE(26, ATNS4W,CDPM1(1), CDPW1)	DRAG1930
CDPW = CDPW1*ATCW*SWSREF	DRAG1940
600 I = 12	DRAG1950
IF(J.EQ.1) WRITE(6,124) I, TN, CDPBT1, CDPT1, CDPW1,THCRT	DRAG1960
GO TO 890	DRAG1970
C	DRAG1980
C***** DRAG CALCULATIONS FOR M.GE. 1.2 *****	DRAG1990
C	DRAG2000
610 CONTINUE	DRAG2010
IF (J .EQ. 1) WRITE(6,DOG)	DRAG2020
C	DRAG2030
C***** MACH NO. 4.000 USES SUPERSONIC ROUTINES *****	DRAG2040
C	DRAG2050
IF (PM.LE.4.) GO TO 620	DRAG2060
620 GO TO (670, 640, 650, 720, 725, 725),ITN	DRAG2070
640 CALL LINE(29,DML,CONVK(1),CDWM2)	DRAG2080
GO TO 700	DRAG2090
650 CALL LINE(29,DML,CDNCO(1),CDWM2)	DRAG2100
GO TO 700	DRAG2110
670 CALL LINE(29,DML,CONOG(1),CDWM2)	DRAG2120
700 CONTINUE	DRAG2130
CDPN = CDWM2/RM**2	DRAG2140

CC TO 730	DRAG2150
720 IF(ITN.EQ.4) CALL LINE(15,RM,CDSPHR(1),CDPN)	DRAG2160
GO TO 730	DRAG2170
725 CONTINUE	DRAG2180
CDWN2 = 0.	DRAG2190
CALL RL TWD(RM,CDPN)	DRAG2200
730 IF (IRTL.EQ.0) GO TO 760	DRAG2210
IF(IRTL.NE.0) GO TO 750	DRAG2220
750 CALL RL INE(10, 21,CDART6(1),RLDB,DD2, CDA)	DRAG2230
CDPRTL = .25*CDA*(1./PLD)**2	DRAG2240
IF(CDPRTL.LT.0.0)CDPRTL=0.0	DRAG2250
760 CONTINUE	DRAG2260
IF(ILUG.EQ.1) CALL LINE(11, RM,FLRM7(1), FL)	DRAG2270
IF(FL.LT.0.) FL = 0.	DRAG2280
IF(ITSECT.NE.1)GO TO 770	DRAG2290
CDPT = THKRT*THKRT/(BETA*(RXINT-RXINT*RXINT))*STSREF	DRAG2300
IF (BTANST.LT.1.0) CDPT=THKRT*THKRT/(TANST*(PXINT-PXINT*RXINT))	DRAG2310
1*STSREF	DRAG2320
IF(IART.NE.1) GO TO 770	DRAG2330
CDPVT=THKRV*THKRV/(BETA*(RXINVT-RXINVT*RXINVT))*SVTSRF	DRAG2340
IF(BTANVT.LT.1.0) CDPVT=THKRV*THKRV/(TANSVT*(RXINVT-RXINVT	DRAG2350
1*RXINVT))*SVTSRF	DRAG2360
770 CONTINUE	DRAG2370
IF(ITSECT.NE.2) GO TO 780	DRAG2380
CDPT = THKRT*THKRT*5.333/BETA*STSREF	DRAG2390
IF(PTANST.LT.1.0) CDPT = THKRT*THKRT*5.333/TANST*STSREF	DRAG2400
IF(IART.NE.1) GO TO 780	DRAG2410
CDPVT=THKRV*THKRV*5.333/BETA*SVTSRF	DRAG2420
IF(PTANVT.LT.1.)CDPVT=THKRV*THKRV*6.333/TANSVT*SVTSRF	DRAG2430
780 CONTINUE	DRAG2440
IF(ITSECT.NE.3) GO TO 820	DRAG2450
AKONS=RCT*(RCT-FLTSET)/(XLENT*(RCT-XLENT-FLTSET))	DRAG2460
CDPT=THKRT*THKRT*AKONS/BETA*STSREF	DRAG2470
IF(BTANST.LT.1.) CDPT=THKRT*THKRT*AKONS/TANST*STSREF	DRAG2480
IF(IART.NE.1) GO TO 820	DRAG2490
AKONSV=PCVT*(RCVT-FLVTST)/(XLENVT*(RCVT-XLENVT-FLVTST))	DRAG2500
CDPVT=THKRV*THKRV*AKONSV/BETA*SVTSRF	DRAG2510
IF(PTANVT.LT.1.)CDPVT=THKRV*THKRV*AKONSV/TANSVT*SVTSRF	DRAG2520
820 CONTINUE	DRAG2530
IF(MW.NE.1) GO TO 880	DRAG2540
IF(IWSECT.NE.1) GO TO 830	DRAG2550
CDPW = THKRW*THKRW/(BETA*(RXINW-RXINW*RXINW))*SWSREF	DRAG2560
IF(PTANSW.LT.1.0) CDPW = THKRW*THKRW/(TANSW*(RXINW-RXINW*RXINW))	DRAG2570
1 *SWSREF	DRAG2580
830 CONTINUE	DRAG2590
IF(IWSECT.NE.2) GO TO 840	DRAG2600
CDPW = THKRW*THKRW*5.333/BETA*SWSREF	DRAG2610
IF(PTANSW.LT.1.0) CDPW = THKRW*THKRW*5.333/TANSW*SWSREF	DRAG2620
840 CONTINUE	DRAG2630
IF(IWSECT.NE.3) GO TO 860	DRAG2640
AKONS = RCW*(RCW-FLTSEW)/(XLENW*(RCW-XLENW-FLTSEW))	DRAG2650
CDPW = THKRW*THKRW*AKONS/BETA*SWSREF	DRAG2660
IF(PTANSW.LT.1.0) CDPW = THKRW*THKRW*AKONS/TANSW*SWSREF	DRAG2670
860 CONTINUE	DRAG2680
IF (J .EQ. 1) WRITE(6,DCG)	DRAG2690

880	CONTINUE	DRAG2700
	I = 13	DRAG2710
	IF(J.EQ.1) WRITE(6,123) I, CDWM2, CDA, ALSRT, ALPT, CNAST	DRAG2720
890	CONTINUE	DRAG2730
	CDPHT=0.0	DRAG2740
	IF(IART.EQ.1) CDPHT=CDPT	DRAG2750
	CDPNAR(JJ)=CDPN	DRAG2760
	CDLAR(JJ)=CDL	DRAG2770
	CDPWAR(JJ)=CDPW	DRAG2780
	CDHTAR(JJ)=CDPHT	DRAG2790
	CDVTAR(JJ)=CDPVT	DRAG2800
	CDTLAR(JJ)=CDPT	DRAG2810
	CDPLS=CDPW + CDPT + CDPVT	DRAG2820
	CDPLSA(JJ)=CDPLS	DRAG2830
	CDPTAR(JJ)=CDPBT	DRAG2840
		DRAG2850
C	***** LUG PRESSURE DRAG *** ALL MACH. NUMBERS *****	DRAG2860
C		DRAG2870
	CDL = FL/SREF	DRAG2880
C		DRAG2890
	CDFL1=0.0	DRAG2900
	CDFL2=0.0	DRAG2910
900	CONTINUE	DRAG2920
	CDFXR1(JJ)=CDFL1	DRAG2930
	CDFXR2(JJ)=CDFL2	DRAG2940
		DRAG2950
C	***** TOTAL BODY DRAG *** ALL MACH. NUMBERS *****	DRAG2960
C		DRAG2970
	CDOR = CDPN+CDPBT+CFB+CDL	DRAG2980
	CDOR=CDOR + CDFL1 + CDFL2	DRAG2990
	CDPBD(JJ)=CDOR-CFB	DRAG3000
	I = 14	DRAG3010
	IF(J.EQ.1) WRITE(6,122) I, CDPN, CDPBT, CFB, CDL, CDOR	DRAG3020
C		DRAG3030
C	***** TOTAL WING DRAG *** ALL MACH. NUMBERS *****	DRAG3040
C		DRAG3050
	CDOW=CDPW + CFW	DRAG3060
C		DRAG3070
C		DRAG3080
C	***** TOTAL TAIL DRAG *** ALL MACH. NUMBERS *****	DRAG3090
C		DRAG3100
903	CONTINUE	DRAG3110
	CDOT = CDPT+CFT	DRAG3120
C		DRAG3130
C	***** BASE PRESSURE DRAG (POWER ON/POWER OFF) *****	DRAG3140
C		DRAG3150
	CDOVT = 0.0	DRAG3160
	IF(IART.NE.1) GO TO 906	DRAG3170
	CDOVT=CDPVT + CFVT	DRAG3180
906	CONTINUE	DRAG3190
	IF (KSTEP .LE. 1) GO TO 915	DRAG3200
	KSYS = 1	DRAG3210
	NTEN = 10	DRAG3220
	KINDR = MOD(KIND,NTEN)	DRAG3230
	IF (KINDR .NE. 3) GO TO 8497	DRAG3240

CALL BOOSTD(RM, ALT, CDBST)	DRAG3250
CDRON = CDBST	DRAG3260
CDOFF = CDBON	DRAG3270
GO TO 1177	DRAG3280
8497 CONTINUE	DRAG3290
EXIT = PEXIT	DRAG3300
908 CONTINUE	DRAG3310
CDRON=0.0	DRAG3320
CDOFF=0.0	DRAG3330
IF (KSTEP .LE. 1) GO TO 1177	DRAG3340
DE = SQRT (576. * EXIT / PI)	DRAG3350
AR = (CR**2 - DE**2) / D1**2	DRAG3360
CALL LINE(10, RM, BASECP(1), CPBASE)	DRAG3370
CDOFF=-CPBASE*DB**3/D1**3	DRAG3380
CDRON=-CPBASE*AR*DB/D1	DRAG3390
1177 CONTINUE	DRAG3400
CDROFF(JJ)=CDOFF	DRAG3410
CDRON(JJ)=CDRON	DRAG3420
I = 15	DRAG3430
IF(J.EQ.1) WRITE(6,125) I, CDPW, CFW, CDOW, CDPT, CFT, CDT	DRAG3440
C	DRAG3450
910 CONTINUE	DRAG3460
CDI=0.0	DRAG3470
IF (KSTEP .LE. 1) GO TO 1199	DRAG3480
IF (KIND .LT. 30) GO TO 1199	DRAG3490
ZAP(23)=ALT*1000.	DRAG3500
ZASAV = ZARZ(16)	DRAG3510
ZARZ(16) = RM	DRAG3520
CALL CDINLT	DRAG3530
FPGCC(JJ)=CDPAFT/ACA3	DRAG3540
CCOWL(JJ)=CDCOWL/ACA3	DRAG3550
RLDVAR(JJ)=CDPDIV/ACA3	DRAG3560
CDPINL=CDPDIV + CDPAFT + CDCOWL + CDPFWD	DRAG3570
CDPINX(JJ)=CDPINL	DRAG3580
CDPINT(JJ)=CDPINL*XNINLT	DRAG3590
XINCD(JJ)=CDSKIN * XNINLT	DRAG3600
ZARZ(16)= ZASAV	DRAG3610
CDTOT=CFR + CFW + CFT + CFVT+ (CDSKIN + CDPDIV + CDPFWD)*XNINLT	DRAG3620
FRICCD(JJ)=CDTOT	DRAG3630
1159 CONTINUE	DRAG3640
966 CONTINUE	DRAG3650
C	DRAG3660
C***** TOTAL ZERO LIFT DRAG (POWER ON) *** ALL MACH. NUMBER	DRAG3670
C	DRAG3680
CDON=CDOB + CDT + CDOW + CDI + CDVT + CDBON	DRAG3690
C	DRAG3700
C***** TOTAL ZERO LIFT DRAG (POWER OFF) *** ALL MACH. NUMBER	DRAG3710
C	DRAG3720
CDOFF = CDON-CDRON+CDOFF	DRAG3730
577 CONTINUE	DRAG3740
IF (KSYS .GT. 1) GO TO 920	DRAG3750
CDOB = CDON	DRAG3760
915 CONTINUE	DRAG3770
KSYS = 2	DRAG3780
EXIT = SEXIT	DRAG3790

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GO TO 908
920 CONTINUE
CDOS = CDOON
I = 16
IF(J.EQ.1) WRITE(6,126) I, CDBOFF, CDBON, CDOI, CDOCN, CDOCF
IF ( J .EQ. 1 ) WRITE(6,BUG)
IF ( J .EQ. 1 ) WRITE ( 6, NAMVER )
CDPTOT= CDPN + CDPW + CDPT + CDPVT + CDFL1 + CDFL2 + CDPBTL
I + CDBON + CDPINL*XINLET + CDL
CDPTAR(JJ)=CDPTOT
CDPOFF=CDPTOT - CDBON + CDBOFF
CDPOFA(JJ)=CDPOFF
CDOOMA(JJ)=CDOON
CDOOFA(JJ)=CDOOFF
RETURN
END

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DRAG3800
DRAG3810
DRAG3820
DRAG3830
DRAG3840
DRAG3850
DRAG3860
DRAG3870
DRAG3880
DRAG3890
DRAG3900
DRAG3910
DRAG3920
DRAG3930
DRAG3940
DRAG3950

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SUBROUTINE INLIFX ( NRM, CLAINL, CDBON )
C   NUK,CM-CGSM R.K.MCDONOUGH FIV/EBCD 10/18/73
COMMON /AERZ/ AZU11(11), NAERO(30)
C   PGM=NUK,CM-CGSM GGJ/RKM FIV-EBCD 7/11/73
C   CLINT ANOMALY
REAL*4 KAR,KM
DIMENSION BASECP(20)
COMMON /INSERT/ ZX17(17), TNOZL, ZX15(15)
COMMON /FORNOW/ NRZ,NALT,RMV(20),ALTV(10),FRBT,FACTOR
COMMON /INCOMM/XLDUMP,XFFRNG,XINLET,XTIPCL,STERM,TNC
EQUIVALENCE ( XFFRNG, XFWDA )
COMMON /EXTERN/ZAR(20)
EQUIVALENCE (ZAR(17), XMRJTD ), (ZAR(6),XTOTAL)
EQUIVALENCE ( XCPI, PRAMBL(129) )
EQUIVALENCE(PRAMBL(99), CMAN), (PRAMBL(100), CNBN)
COMMON /CODEXX/ INIZ,ITYPE, I14(14)
COMMON /INDATX/ZX9(9),XCHECK,XFRNG, ZX12(12)
COMMON /RJDAT/ ZX3(3),A6A3,ACA3, ZX4(4)
COMMON /BASVAR/ ZA7(7), SWI, STI, ARW, ZA10(10)
COMMON /UPINLT/ PRAMBL(129), XCGDI
COMMON /ALFBLK/ AMACH, AMEX13(13)
COMMON /LFT/
1 ATNS2T ,ATNS2W ,SEW ,SET ,DMW ,DMT ,
2 RL4 ,RL5 ,ALPHAR ,RITWV ,IART ,ICNTRL ,
3 D2 ,RL2
COMMON/DRG/
1 D1 ,THE TAC ,FINE ,RS ,R1 ,RL1 ,
2 XCYL ,XTHEBT ,XBT ,RL3 ,ITN ,AMACW ,
3 AMACT ,THKRT ,THKRW ,RL1A ,IBTL ,ATCT ,
4 ATCW ,DML ,ITSECT ,IWSECT ,RXINT ,RXINW ,
5 BTANST ,BTANSW ,RCW ,FLTSEW ,XLENW ,FLTSET ,
6 XLENT ,QRATIO ,DN ,DE ,D3 ,RCT ,
7 NW ,TCW ,TCT ,BT ,BW ,ART ,
8 ARWX ,TRT ,TRW ,SREF ,DB
COMMON/AERO/
1 ATNS4T ,ATNS4W ,BTANA ,BART ,BARW ,BAPT ,

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INLI0010
INLI0020
INLI0030
INLI0040
INLI0050
INLI0060
INLI0070
INLI0080
INLI0090
INLI0100
INLI0110
INLI0120
INLI0130
INLI0140
INLI0150
INLI0160
INLI0170
INLI0180
INLI0190
INLI0200
INLI0210
INLI0220
INLI0230
INLI0240
INLI0250
INLI0260
INLI0270
INLI0280
INLI0290
INLI0300
INLI0310
INLI0320
INLI0330
INLI0340
INLI0350
INLI0360

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2	BAPW	,BAPPT	,BAPPW	,BETA	,BFN	,CFT	, INL I0370				
3	CFW	,CDB	,CFB	,CNANAC	,CLABT	,CLAT	, INL I0380				
4	CLAW	,CLTV	,CKWR	,CKBW	,CKBT	,CKTB	, INL I0390				
5	CLATWV	,D	,DD	,DD2	,DPR	,DHL	, INL I0400				
6	FAFN	,F	,FL	,FR	,PI	,RLD	, INL I0410				
7	RLDB	,RBTAMA	,SLETR	,SLEWR	,STSREF	,SWSREF	, INL I0420				
8	SKRT	,SKTB	,SKRW	,SKWB	,TRTP1	,TRWP1	, INL I0430				
9	CFI	,TANST	,TANSW	,TANS4T	,TANS4W	,TANS2T	, INL I0440				
A	TANS2W	,XD1B	,XD1BT	,XD1T	,XD1W	,XNLCMR	, INL I0450				
P	XNLCPB	,ACT	,ACW	,XNLCLR	,BODYL	,TAILL	, INL I0460				
C	WINGL	,RL1SQR	,D1SQR	,FRI	,FCAP	,CDPNX	, INL I0470				
D	ACAP	,TN1	,SPN	,VPN	,FAFN1	,PMN	, INL I0480				
E	ANQSE2	,SWSBN	,RNOSE2	,XLINE	,CR2	,NCON(3)	, INL I0490				
F	CPFMAX	,CRAMAX	,B2	,CNVR	,BI	,BZ	, INL I0500				
G	SV2	,SLEI	,SLEZ	,XVA	,XVB	,XVC	, INL I0510				
H	CT2	,CX	,VOLN	,VOLBT	,VOLBOD	,SWBREF	, INL I0520				
I	BRAT	,ROG					INL I0530				
	COMMON/CHK/CON1,KAR,KM						INL I0540				
	NAMELIST/CHECK/ ARN,SEN,TRN,ATNS2N,BARN,AICLN,THKRN,RXINN,						INL I0550				
	ISLEN,BTANSN,CNRM,DELNN, CON1,KM,KAR						INL I0560				
	NAMELIST/OUTPUT/BN,RCN,TCN,SLEN,XCPI,CLAM,ARN,						INL I0570				
	ICDROFF,CLATWV,RM,CLAIWV,CMAN,CNBN						INL I0580				
	NAMELIST/INPUT/XMRJTO,STERM,XINLET,XLDUMP,XFRNG,XTCTAL,D3,						INL I0590				
	IACA3,A3,SREF,XTIPCL,ITYPE,XFWDA,XD1T,CLAT, RMV,C1,XCHECK,						INL I0600				
	2SET,FRBT,BT,TRT,INOZL,FACTOR,A6A3,XCGD1,ART						INL I0610				
1002	FORMAT(/I3, 2X, 6HINTWOD, 2H, ,						INL I0620				
1	6H XCPI, 2H =, E10.3, 2H, , 6H CLAN, 2H =, E10.3, 2H, ,					INL I0630					
2	6H CLAM, 2H =, E10.3, 2H, , 6H CKNB, 2H =, E10.3, 2H, ,					INL I0640					
3	6H CKBN, 2H =, E10.3, 2H, , 6HCLAINL, 2H =, E10.3)					INL I0650					
	DATA BASECP/						INL I0660				
1	0.0, -.137, 0.8, -.137, 0.9, -.145, 1.0, -.195, 1.2, -.191,						INL I0670				
1	1.5, -.172, 2.0, -.141, 3.0, -.092, 4.0, -.065, 5.0, -.048/						INL I0680				
	PI = 3.141593						INL I0690				
	C = PI / 180.						INL I0700				
	DPR = 57.29578						INL I0710				
	ALT=1.						INL I0720				
	ALPHAR=C.						INL I0730				
	ARWX = ARW						INL I0740				
	CDNRTL=C.0						INL I0750				
	A2 = ZAR(12)						INL I0760				
	ICUT = NAERO(15)						INL I0770				
	A3 = A2 * 144.						INL I0780				
	SREF = A3						INL I0790				
	C3 = ZAR(3)						INL I0800				
	C1 = D3						INL I0810				
	R1=D1/2.						INL I0820				
	RL3 = XTOTAL						INL I0830				
	IF (ICUT.EQ.1) WRITE(6,INPUT)						INL I0840				
	DO 100 J=1,NRM						INL I0850				
	RM=RMV(J)						INL I0860				
	IF (NRM .LE. 1) RM = AMACH						INL I0870				
	IF(ITYPE.NE.2) GO TO 5000						INL I0880				
	IF(RM.LT.XMRJTO) GO TO 5100						INL I0890				
	BN=STERM*2.0						INL I0900				
	RCN=XINLET + XLDUMP + 0.5*XFRNG						INL I0910				

TCN=RCN	INL10920
SLEN=0.0	INL10930
THKRN=0.05	INL10940
RXINN=0.5	INL10950
XCPI = XCHECK / D3	INL10960
SEF=2.0*RCN*STERM	INL10970
CLAM=2.0*ACA3*A3/(57.296*SREF)	INL10980
GO TO 5300	INL10990
5000 IF(RM.LT.XMRJTO) GO TO 5200	INL11000
CLAINL=C.0	INL11010
CLAM=2.0*ACA3*A3/(57.296*SREF)	INL11020
RCN=XINLET + XLDUMP + 0.5*XFRNG + XTIPCL	INL11030
TCN=RCN - XTIPCL	INL11040
SLEN=ATAN(STERM/XTIPCL)	INL11050
5050 CONTINUE	INL11060
THKRN=0.05	INL11070
RXINN=0.5	INL11080
XCPI = XCHECK / D3	INL11090
XFLUMM = (XTOTAL - XINLET - XLDUMP - XFRNG) / D3	INL11100
IF (ITYPE .EQ. 1 .AND. RM.GT.XMRJTO) XCPI = XFLUMM	INL11110
SEN= (RCN + TCN)*STERM	INL11120
PN =2.*STERM	INL11130
ARN=PN*BN/SEN	INL11140
GO TO 5300	INL11150
5100 CLAM=0.0	INL11160
RCN=XINLET + XLDUMP + XFWDA + 0.5*XFRNG	INL11170
TCN=RCN - XFWDA	INL11180
PN=STERM*2.0	INL11190
SLEN=0.0	INL11200
IF(XFWDA.GT.0.0) SLEN=ATAN(STERM/XFWDA)	INL11210
THKRN=0.05	INL11220
RXINN=0.5	INL11230
RXINN=0.5	INL11240
XCPI = XCHECK / D3	INL11250
SEF=0.5*(RCN + TCN)*BN	INL11260
GO TO 5300	INL11270
5200 CLAM=0.0	INL11280
CLAI=0.0	INL11290
RCN=XINLET + XLDUMP +0.5*XFRNG + XFWDA	INL11300
TCN=RCN-XFWDA	INL11310
SLEN=0.0	INL11320
IF(XFWDA.GT.0.0) SLEN=ATAN(STERM/XFWDA)	INL11330
GO TO 5050	INL11340
5300 ARN=BN*BN/SEN	INL11350
C***** SWEEP ANGLE LIMIT OF 62.5 DEG. *****	INL11360
C	INL11370
IF(SLEN.GT.1.0908) SLEN = 1.0908	INL11380
TRN = TCN/RCN	INL11390
SVAL = SLEN	INL11400
IF (SVAL.EQ.0.0) SVAL=C.01	INL11410
TANSN = TAN(SVAL)	INL11420
TANS2N = TANSN+(TCN-RCN)/BN	INL11430
ATNS2N = ARN*TANS2N	INL11440
BETA = SQRT(ABS(RM*RM-1.0))	INL11450
BARN = BETA*ARN	INL11460

PTANSN = BETA/TANSN	INL11470
ALSFN = 0.	INL11480
CNASN = 0.	INL11490
ALPT = C.	INL11500
DFN = 0.	INL11510
VMN = RM*SQRT(1.-(SIN(SLFN)**2))	INL11520
DDELN = ATAN(THKRN/(PXINN+RXINN))	INL11530
DELNN = DPR*DDELN/COS(SLFN)	INL11540
C	INL11550
C***** LINEAR LIFT DUE TO NACELLES *****	INL11560
C	INL11570
CALL LIFT1(ARN, SFN, TRN, ATNS2N, BARN, AICLN, THKRN, RXINN, SLEN,	INL11580
1 PTANSN, CNRN, DELNN, CLAN, RM)	INL11590
IF (IOUT.EQ.1) WRITE(6,CHECK)	INL11600
IF(RM.GE.1.0.AND.RM.LE.1.65) KM=0.35 + 1.*(RM-1.)	INL11610
IF(RM.GT.1.65.AND.RM.LE.2.1) KM=1.	INL11620
IF(RM.GT.2.1.AND.RM.LE.3.65) KM=1.-0.515*(RM-2.1)	INL11630
IF(RM.GT.3.65.AND.RM.LE.5.0) KM= .2-.148*(RM-3.65)	INL11640
IF(RM.GT.5.) KM=C.	INL11650
KAR=-.2468 + .2463/ARN	INL11660
CLANI=CLAN/(1. + KM*KAR)	INL11670
TRNP1 = TRN+1.0	INL11680
BAPN = 0.0	INL11690
IF (RM.NE.1.0) BAPN=BARN*TRNP1*(1.0+1.0/BTANSN)	INL11700
RLLN=XCHECK -XFWDA	INL11710
IF(RM.GE.XMRJTO) PLLN=XCHECK	INL11720
DMNN = D3	INL11730
C	INL11740
C***** CARRYOVER TERMS *****	INL11750
C	INL11760
CALL LIFT2(BTANSN, TRNP1, RCN, DMNN, ARN, BN, BAPN, BARN, CLAN, AICLN,	INL11770
1 RLLN, CKNB, CKBN, RM)	INL11780
C	INL11790
C***** TOTAL LINEAR NACELLE LIFT *****	INL11800
C	INL11810
CLAINL=CLANI*(CKNB + CKBN) + CLAM	INL11820
IF(ITYPE.EQ.1) CLAINL = CLAM	INL11830
IF (ITYPE .EQ. 1) CLAINL = CLAM	INL11840
I = 3	INL11850
IF (IOUT.EQ.1) WRITE(6,1002) I, XCPI, CLAN, CLAM, CKAB, CKBN, CLAINL	INL11860
CLI = 0.	INL11870
CNNE = 0.	INL11880
CNAAN = 0.	INL11890
IV=2	INL11900
LINFAR=1	INL11910
CWI=0.	INL11920
CMW=D3	INL11930
CMT=D3	INL11940
AHL=XCHECK	INL11950
IF(ITYPE.EQ.1) GO TO 202	INL11960
IF(ITYPE.EQ.2) CYBI=CLAM	INL11970
IF(ITYPE.EQ.2) XCPIY=XCHECK	INL11980
GO TO 203	INL11990
202 CONTINUE	INL12000
CLATWV=0.0	INL12010


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      IF(ITYPE.EQ.1) XCPIY=XCPI
      IF(ITYPE.EQ.1) CYBI=0.5*CLAN*(CKBN + CKNB) + CLAM
C.....BOATTAIL GEOMETRY
203 CONTINUE
      CMAN=CLAINL*(XCGD1-XCPI)*57.296
      CNBN=CYBI*(XCGD1-XCPIY)*57.296
      XPT=FRBT*D1
      DE = SQRT ( 4. * A6A3 * A3 / PI )
      DR=DE + FACTOR*(D3-DE)
      IF(XRT.GT.TNOZL+1.) XRT=TNOZL+1.
      IF(DR.LT.D3) GO TO 205
      DR=D3
      IPTL=0
      GO TO 207
205 CONTINUE
      IF(IRTL.EQ.C) GO TO 206
      RL2=XTOTAL-XRT
      TANBT=(D1-DR)*0.5/(XTOTAL-RL2)
      IF(TANBT.GE.0.286) TANBT=0.286
      IF(TANBT.LT.0.0525) GO TO 206
C.....MAXIMUM BOATTAIL ANGLE IS 17 DEG.....
      DR=D1-2.*(XTOTAL-RL2)*TANBT
      THETBT=ATAN((D1-DR)/(2.*XRT))
      R1=D1/2.
      XTHERBT=R1/TAN(THETBT)
      GO TO 207
206 CONTINUE
      IPTL=0
      THETBT=0.0
      XRT=0.0
      DR=D1
207 CONTINUE
      AR=(DP**2-DE**2)/D3**2
      CALL LINE(10, RM, BASECP(1), CPBASE)
      CDBN=-CPBASE*AR*DB/D3
      CDBOFF=-CPBASE*CR**3/D3**3
      IF ( IOUT.EQ.1) WRITE(6,OUTPUT)
100 CONTINUE
      RETURN
      END

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INLI2020
INLI2030
INLI2040
INLI2050
INLI2060
INLI2070
INLI2080
INLI2090
INLI2100
INLI2110
INLI2120
INLI2130
INLI2140
INLI2150
INLI2160
INLI2170
INLI2180
INLI2190
INLI2200
INLI2210
INLI2220
INLI2230
INLI2240
INLI2250
INLI2260
INLI2270
INLI2280
INLI2290
INLI2300
INLI2310
INLI2320
INLI2330
INLI2340
INLI2350
INLI2360
INLI2370
INLI2380
INLI2390
INLI2400
INLI2410

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SUBROUTINE LIFT(RM,CNA,KSTEP)
C PGM=NUK .CMCGSM GGJ/RKM FIV/EBCD 9/10/73
DOUBLE PRECISION Q,Q1,Q2,A1,A2,ZZI,CVV,CVVT,CVVW
COMMON/AA/CP37AL(45),CP314A(45),CP27AL(45),CP214A(45),XCPREN(36),
4XCPBPP(36),XCP74(133),XCP64(45),XCP65(45),XCP75(133),CNA21(90),
5CNA22(78),CNA23(105),CNA24(77),VOLRA(78),EKFRB(34)
A,CNA72(152),CNA73(152)
COMMON/AERO/
1 ATNS4T ,ATNS4W ,BTANA ,BART ,BARW ,BAPT ,
2 BAPW ,RAPPT ,BAPPW ,BETA ,RFN ,CFT ,
3 CFW ,CDB ,CFB ,CNANAC ,CLABT ,CLAT ,
4 CLAW ,CLTV ,CKWB ,CKBW ,CKRT ,CKTR ,

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LIFT0010
LIFT0020
LIFT0030
LIFT0040
LIFT0050
LIFT0060
LIFT0070
LIFT0080
LIFT0090
LIFT0100
LIFT0110
LIFT0120

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5 CLATWV ,D ,DD ,DD2 ,DPR ,DHL , LIFT0130
6 FAEN ,F ,FL ,FR ,PI ,RLD , LIFT0140
7 FLDB ,RBTANA ,SLETR ,SLEWR ,STSREF ,SWSREF , LIFT0150
8 SKRT ,SKTB ,SKBW ,SKWB ,TRTP1 ,TRWP1 , LIFT0160
9 CFI ,TANST ,TANSW ,TANS4T ,TANS4W ,TANS2T , LIFT0170
A TANS2W ,XD1B ,XD1BT ,XD1T ,XD1W ,XNLCMP , LIFT0180
B XNLCDB ,ACT ,ACW ,XNLCB ,BODYL ,TAILL , LIFT0190
C WINGL ,RL1SOR ,DISQR ,FR1 ,FCAP ,CDPNX , LIFT0200
D ACAP ,TN1 ,SPN ,VPN ,FAFN1 ,PMN , LIFT0210
E ANDSE2 ,SWSBN ,RNOSE2 ,XLINE ,CR2 ,NCCN(3) , LIFT0220
F CPFMAX ,GRAMAX ,B2 ,CNVR ,BI ,BZ , LIFT0230
G SV2 ,SLEI ,SLEZ ,XVA ,XVB ,XVC , LIFT0240
H CT2 ,CX ,VOLN ,VOLBT ,VOLBCD ,SWREF , LIFT0250
I BRAT ,ROG , LIFT0260
COMMON/AERZ/ CDOB,CDOV,CDOY,CDOON,CDOOFF,CDBON,CDBCF,CDOI ,ITRIP, LIFT0270
1 FRPT,FRB,NAERO , LIFT0280
COMMON /ALFBLK/ AMUNCH, AMEX(13) , LIFT0290
COMMON/ARINDX/ JJ,ARIN(9) , LIFT0300
COMMON/BLKQ/ Q1(20), Q(96), Q2(96), , FRCTN1(42), FRCTN2(90) LIFT0310
1 ,FRCTN3(42) , LIFT0320
COMMON /CODEXX/ KIND, IIKI(15) , LIFT0330
COMMON/DELTA/DELALP,CMDW,CMDT , LIFT0340
COMMON/DRG/ , LIFT0350
1 D1 ,THETAC ,FINE ,RS ,R1 ,RL1 , LIFT0360
2 XCYL ,XTHERT ,XBT ,RL3 ,ITN ,AMACW , LIFT0370
3 AMACT ,THKRT ,THKRW ,RL1A ,IBTL ,ATCT , LIFT0380
4 ATCW ,DML ,ITSECT ,IWSECT ,RXINT ,RXINW , LIFT0390
5 BTANST ,BTANSW ,RCW ,FLTSEW ,XLENW ,FLTSET , LIFT0400
6 XI FNT ,QRATIO ,DN ,DE ,D3 ,RCT , LIFT0410
7 NW ,TCW ,TCT ,BT ,BW ,ART , LIFT0420
8 ARW ,TRT ,TRW ,SREF ,DB , LIFT0430
COMMON/EXTERN/ ARR(20) , LIFT0440
EQUIVALENCE(ARR(5), WMISS) , LIFT0450
COMMON/FIXUP/ DA, DD12, FIX8(8) , LIFT0460
COMMON/HING/RHLTXX,RHLW , LIFT0470
COMMON/LFT/ , LIFT0480
1 ATNS2T ,ATNS2W ,SEW ,SET ,DMW ,DMT , LIFT0490
2 RL4 ,RL5 ,ALPHAR ,RITWV ,IART ,ICNTRL , LIFT0500
3 D2 ,RL2 , LIFT0510
COMMON/NAERC/ RNA6(6), DCASE, RNA15(15), RHLT, RNA2(2) , LIFT0520
COMMON/ROLL/ RNW,RNT,IARW,BWH,BTH , LIFT0530
COMMON/SAVTIM/ KCLA,SAVT(5) , LIFT0540
COMMON/SUMLIF/CNANOS(20),CNAF1(20),CNAB1(20),CNAF2(20),CNAP2(20), LIFT0550
1 CNABT(20), CNAPD(20),CLAWAR(20), CLAWBA(20), CLABCC(20), , LIFT0560
2 CLWBAR(20), CLATAP(20), CLATBA(20), CLATCO(20), CLAWVA(20), , LIFT0570
3 CLTWAR(20), CLATOT(20), CLDUMX(80) , LIFT0580
COMMON/TWU/ GPDEG,ALPTRM,CLATRM,DELTRM , LIFT0590
COMMON/TWX/ RHLTW,VCHAV,VCHDV,CHVL,DYNP,ALINW,CNINW,WMISX , LIFT0600
COMMON/TWY/CHAW,CHDW,CNDW,CNDT,CHAT,CHDT,CLP,CLRD,CNO,CNAP,CMAT, , LIFT0610
1 CMAW,CMAOT,CMDDOT , LIFT0620
COMMON/UPINLT/ PRAMBL(128), XCPI, XCGD1 , LIFT0630
COMMON/VERT/ SVTSPE, BARVT, TANOV, TAN2VT, TAN4VT, , LIFT0640
1 ACVT, ATN2VT, ATCVT, AMACVT, TMACVT, BTANVT, , LIFT0650
2 BDCVT, TRTPV1, BAPPVT, BAPVT, FLVTST, XLENVT, , LIFT0660
3 CEVT, TRAVT, RXINVT, FSOVVT , LIFT0670

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COMMON/VORLOC/ FSUPER(57),F SUB(57)	LIFT0680
COMMON/WLOC/ XD11	LIFT0690
COMMON/YAWC/ CNR,CNBETA,CYBETA	LIFT0700
COMMON/XXX/ AIC60(301),AIC61(301),CNR66(90),CNR67(42),	LIFT0710
IXSR46(26),ANL47(28),ANL48(30),ANL49(30),SKK17(85),XAC78(219),	LIFT0720
2XAC79(219),XACC18(85),XAC271(50),XAC28(177),XAC291(6)	LIFT0730
COMMON/XYZ/CMA,XD1,CMQ	LIFT0740
EQUIVALENCE(PRAMBL(99),CMAN),(PRAMBL(100),CNBN)	LIFT0750
DIMENSION RMV(20),ALTV(10),ALPHAV(10),NAERO(30)	LIFT0760
NAMelist/FLRBUG/ CNAFL1,CNAFL2,CNABY,FLROUT,NFLR,KFLR,NINV,NVAR,	LIFT0770
1 CNARPD,CNANDS,CNAFL,CNAB1,CNAF2,CNAB2,CNABT	LIFT0780
2,CCASE,SREF,CNAAR,X	LIFT0790
NAMelist/PUG/D3,D2,BTL,VBSL,SBASE,SREF,ALPHAR,VOLN,VOLRAT,	LIFT0800
1 RBTON,CNANAC,CNARTL,VSBL,CPRAT,XD1B,PLD,D,RL2,XD1RTL	LIFT0810
NAMelist/SLOM/ TERMA,TERMB,TERMC,TERMD,TERME,TERMF,TERMG,	LIFT0820
1TERMH,TERMI,CNR,CNBETA,CYBETA	LIFT0830
NAMelist/ROLL/ BW,RCW,TCW,DMW,ARMYW,PKRW,DMT,BT,RCI,TCT,	LIFT0840
1 PKRT,CLAW,CLAT,CLPW,CLPT,CLAARW,CLP,SPANR,CMQ,PK,PKK,	LIFT0850
2 PKRTD,TPT,SKTB,RNT,RNW,CMADOT,ARMYT,XQTM,T,XQTMW	LIFT0860
1 FORMAT(/I3, 2X, A6, 6(2H, A6, 2H =, F10.3))	LIFT0870
110 FORMAT(/I4, 1X, 6H AERO, 2H, ,	LIFT0880
1 6H DNM, 2H =, F10.3, 2H, , 6H CNMMD, 2H =, F10.3, 2H, ,	LIFT0890
2 6H CMNMD, 2H =, F10.3, 2H, , 6H CDDI, 2H =, F10.3, 2H, ,	LIFT0900
3 6H CNIED, 2H =, F10.3, 2H, , 6H CHID, 2H =, F10.3)	LIFT0910
127 FORMAT(/I3, 2X, 6H AERO, 2H, ,	LIFT0920
1 6H CMAR, 2H =, F10.3, 2H, , 6H CMAT, 2H =, F10.3, 2H, ,	LIFT0930
2 6H CMAW, 2H =, F10.3, 2H, , 6H CMA, 2H =, F10.3, 2H, ,	LIFT0940
3 6H CMQ, 2H =, F10.3, 2H, , 6H CMDI, 2H =, F10.3, 2H, /	LIFT0950
413X, 6H CLRD, 2H =, F10.3, 2H, , 6H PKRTD, 2H =, F10.3, 2H, ,	LIFT0960
5 6H CMI, 2H =, F10.3)	LIFT0970
6025 FORMAT(/I3, 2X, 6H AERO, 2H, ,	LIFT0980
1 6HDELTRD, 2H =, F10.3, 2H, , 6H CNTDT, 2H =, F10.3, 2H, ,	LIFT0990
2 6H CNDT, 2H =, F10.3, 2H, , 6H DNMT, 2H =, F10.3)	LIFT1000
6026 FORMAT(/I3, 2X, 6H AERO, 2H, ,	LIFT1010
1 6HDELTRD, 2H =, F10.3, 2H, , 6H CNTDW, 2H =, F10.3, 2H, ,	LIFT1020
2 6H CNDW, 2H =, F10.3, 2H, , 6H DNMW, 2H =, F10.3)	LIFT1030
POLY (X,C0,C1,C2,C3) = X * (X*(C3*X + C2) + C1) + C0	LIFT1040
C TAKE OUT LATER	LIFT1050
JJ = 1	LIFT1060
R3SV=C3	LIFT1070
C3=DR	LIFT1080
J = NAERD(15)	LIFT1090
CNARTL = 0.	LIFT1100
RPTON = 0.	LIFT1110
IF(IIBTL.EQ.0) GO TO 950	LIFT1120
ADD = D3/D2	LIFT1130
VPSI = POLY (ADD,.339,.312,.501,-.152)	LIFT1140
940 CONTINUE	LIFT1150
SBASE = PI *(D3/2.)**2	LIFT1160
BTL = RL3 - RL2	LIFT1170
VBT = VBSL * BTL * SBASE * (D2/D3)**2	LIFT1180
VOLRAT = VBT * (1.-SBASE/SREF)/VOLN	LIFT1190
CALL PLINE (6,6,VOLRA(1),ALPHAR,VOLRAT,RBTON)	LIFT1200
950 CONTINUE	LIFT1210
	LIFT1220


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      IF(ITRIP) 960, 970, 980
      960 CONTINUE
C***** M.LE.0.9 *** BODY LIFT (NOSE AND CYLINDER) *****
C      CALL LINE(17, FPR, EKFRB(1),EK)
      CNANAC = (EK+EK)/DPR
C***** M.LE. 0.9 *** BODY LIFT (BOAT-TAIL)*****
C      CNABTL = PRTON * CNANAC
      I = 17
      IF(J.EQ.1) WRITE(6,1) I, Q(1), Q(6), EK, Q(8), CNANAC, Q(12),
1 CNABTL, Q(21), FPR
      IF ( J .EQ. 1 ) WRITE(6,BUG)
      GO TO 1020
      970 CONTINUE
C***** M = 1.0 *** BODY LIFT (NOSE AND CYLINDER) *****
C      CNANAC = .042
C***** M = 1.0 *** BODY LIFT (BOAT-TAIL) *****
C      CNABTL = PRTON * CNANAC
      I = 18
      IF(J.EQ.1) WRITE(6,1) I, Q(1), Q(8), CNANAC, Q(10), DA, Q(14), D,
1 Q(9), DD12, Q(12), CNABTL
      GO TO 1020
      980 CONTINUE
C***** M .GE. 1.2 *** BODY LIFT (NOSE AND CYLINDER) *****
C      CALL LIFT4(PFN, CNANAC,RM)
      BNA = 0.
      IF(1BTL.EQ.0) GO TO 1010
C***** M .GE. 1.2 *** BODY LIFT (BOAT-TAIL) *****
C      IF(RLDR.GE.4.75) GO TO 990
      BNA=-(0.1*RLDR**2-C.9*RLDR-0.01)
      GO TO 1000
      990 BNA= 2.0
      1000 CNABTL = -BNA*(1.0-DD2)/DPR
      1010 CONTINUE
      I = 19
      IF(J.EQ.1) WRITE(6,1) I, Q(1), Q(8), CNANAC, Q(11), BNA, Q(12),
1 CNABTL
      1020 CONTINUE
C***** LINEAR LIFT DUE TO THE TAIL ... (ALL MACH NUMBERS) *
C      IF(NAERO(8).EQ.2) GO TO 1025
      CALL LIFT1(ART,SET,TRT,ATNS2T,BART,AICLT,THKRT,RXINT,SLETR,PTANST,
1 CNRT,DELNT,CLAT,RM)
C***** LINEAR LIFT DUE TO THE WING ... (ALL MACH NUMBERS) *

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C
1025 CONTINUE
CLAW = 0.0
AICLW = 0.0
IF (NW.NE.1) GO TO 103C
IF (NAFFO(2).EQ.2) GO TO 103C
CALL LIFT1(ARW,SEW,TRW,ATNS2W,BARW,AICLW,THKRW,RXINW,SLEWR,BTANSW,
1 CNRW,DFLNW,CLAW,RM)
CLAW = CLAW*QRATIO
CLXW=CLAW*PI*D1**2/4./SREF
CLAWR(JJ)=CLXW
1030 CONTINUE
I = 20
IF (J.EQ.1) WRITE(6,1) I, Q(1), Q(27), AICLT, Q(61), CLAT,
1 Q(28), AICLW, Q(62), CLAW
C
C***** LINEAR BODY-TAIL INT. LIFT *** ALL MACH. NUMBERS ****
C
CALL LIFT2(BTANSI,TRTPI,RCI,DMT,ART,BT,BAPT,BART,CLAT,AICLT,RI4,
1 CKTB,CKBT,PM)
C
C***** TOTAL LINEAR LIFT DUE TO THE TAIL --- ALL MACH NUMBER
C
CLATBA(JJ)=CLAT*CKTB
CLATCB(JJ)=CLAT*CKBT
CLXT=CLAT*PI*D1*D1/4.
CLXT=CLXT/SREF
CLATAR(JJ)=CLXT
CLATB = CLAT*(CKBT+CKTB)
CLATWV=0.
CLAWB = 0.
CKWB = 0.
CKRW = 0.
IF (NW.EQ.0) GO TO 1040
C
C***** LINEAR BODY-WING INT. LIFT *** ALL MACH. NUMBERS ****
C
CALL LIFT2(BTANSW,TRWPI,RCW,DMW,ARW,BW,BAPW,BARW,CLAW,AICLW,RI5,
1 CKWB,CKRW,RM)
C
C***** TOTAL LINEAR LIFT DUE TO THE WING --- ALL MACH NUMBER
C
CLAWBA(JJ)=CLAW*CKWB
CLABCB(JJ)=CLAW*CKRW
CLAWB = CLAW*(CKWB+CKRW)
CLWBAR(JJ)=CLAWB
C
C***** LINEAR WING-TAIL INT. LIFT *** ALL MACH. NUMBERS ****
C
IV = 2
LINEAR = 1
DW1 = 0.
CALL LIFT3(TRT, BT, DMT, XD1T, GAMMAT, DW1, LINEAR, IV, RITWV,APL,
1 RM)
FMDMW2 = F-DMW/2.

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      IF(FMDMW2.EQ.C.) FMDMW2 = .002
      CLATWV =(CLAW*CLAT*CKWB*RITWV*BT      /(4.*PI*ART*FMDMW2      )
1    ) * SPEF / SET
      CLAWVA(JJ)=CLATWV
1040 CONTINUE
      I = 21
      IF(J.FQ.1)WRITE(6,1) I, Q1(1), Q2(57), CKTB, Q2(58), CKBT, Q2(59),
1    CLATB, Q2(60), CKWB, Q2(61), CKBW, Q2(62), CLAWB
C ***** LINEAR LIFT DUE TO INTAKES *** ALL MACH. NUMBERS *****
C *****ALREADY AVAILABLE FROM INLET S/R *****
      XCPI = 0.0
      CLAI=0.0
      IF ( KSTEP .LE. 1 ) GO TO 1188
      IF ( KIND .LT. 30 ) GO TO 1188
      AMUNCH = RM
      NRM=1
      CALL INLIFX(NRM,CLAI,CDBON)
1188 CONTINUE
      CNAFL1=C.0
      CNAFL2=0.0
      CNAAB1=0.0
      CNAAB2=0.0
1046 CNAR=(CNANAC + CNAFL1 + CNAAB1 + CNAFL2 + CNAAB2 + CNABTL)*DPR
      CNABPC=CNAR/DPR
      CNAPD(JJ)=CNABPD
      CNANOS(JJ)=CNANAC
      CNAFL(JJ)=CNAFL1
      CNAB1(JJ)=CNAAB1
      CNAF2(JJ)=CNAFL2
      CNAB2(JJ)=CNAAB2
      CNART(JJ)=CNARTL
      IF(J .FQ. 1) WRITE(6,FLRBUG)
C
C ***** TOTAL LINEAR LIFT *** ALL MACH. NUMBERS *****
C
      COST = 1.
      IF (IART.EQ.3) COST = .750
      COSW = 1.
      IF (IAPW.FQ.3) COSW = .750
      CLAAWV=CLATWV
C
C DUMMY
      KFIXK = 1
      IF( (NW.FQ.0) .AND. (KFIXK.GT.0) ) CLAAWV=0.0
C
      CNA = (CNANAC+CNARTL+CLAI+(CLATB+CLAAWV)*COST+CLAWB*COSW)*DPR
      CNA=CNA + (CNAFL1 + CNAAB1 + CNAAB2 + CNAFL2)*DPR
      CLATOT(JJ)=CNA/DPR
      CNAT = (CLATB+CLATWV)*COST
      CLTWAR(JJ)=CNAT
C
C ***** CONTROL LIFT *** ALL MACH. NUMBERS *****

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C		LIFT2880
	SKWP = 0.	LIFT2890
	SKRW = 0.	LIFT2900
	SKTP = 0.	LIFT2910
	SKBT = 0.	LIFT2920
	CMDT = 0.0	LIFT2930
	CNDW = 0.0	LIFT2940
	IF(ICNTRL.EQ.1) GO TO 1050	LIFT2950
	CALL LIFTS(RW,IAPW,CKWB,CKBW,CLAW,CNDW,SKWB,SKRW)	LIFT2960
	I = 22	LIFT2970
	IF(J.EQ.1)WRITE(6,1) I, Q1(1), Q2(63), CLATWV, Q2(64), CNA,	LIFT2980
	1 Q2(65), SKWB, Q2(66), SKBW, Q2(72), CNDW	LIFT2990
	GO TO 1060	LIFT3000
1050	CALL LIFTS(RT,IART,CKTB,CKBT,CLAT,CMDT,SKTB,SKBT)	LIFT3010
	I = 22	LIFT3020
	IF(J.EQ.1)WRITE(6,1) I, Q1(1), Q2(63), CLATWV, Q2(64), CNA,	LIFT3030
	1 Q2(55), SKTB, Q2(56), SKBT, Q2(71), CNDT	LIFT3040
1060	CONTINUE	LIFT3050
C		LIFT3060
C	***** PITCHING MOMENTS AND CENTERS OF PRESSURE *****	LIFT3070
C		LIFT3080
C	*****NOSE AND CYLINDER *** M LE 1.0*****	LIFT3090
C		LIFT3100
	IF (ITRIP.GT.C) GO TO 1100	LIFT3110
	CPRAT = 1.	LIFT3120
	ALOD = FR	LIFT3130
	IF(ITN.GT.4) ALOD = FR1	LIFT3140
	IF(ALOD.GT.5.) ALOD = 5.	LIFT3150
	IF(ALOD.LT.1.) ALOD = 1.	LIFT3160
	AFAFN = FAFN	LIFT3170
	IF(ITN.GT.4) AFAFN = FAFN1	LIFT3180
	IF(ITN.EQ.2) AFAFN = FAFN1	LIFT3190
	IF(ITN.NE.3.OR.ITN.NE.5) GO TO 1070	LIFT3200
	CPRC1 = POLY(AFAFN,.978,.090,-.009,.0003)	LIFT3210
	CPRC5 = POLY(AFAFN,.906,.427,-.045,.0013)	LIFT3220
	CPRAT = CPRC1+(CPRC5-CPRC1)/4.*(ALOD -1.)	LIFT3230
	GO TO 1080	LIFT3240
1070	CPRC1 = POLY(AFAFN,.955,.295,-.021,.00001)	LIFT3250
	CPRC5 = POLY(AFAFN,.938,.498,-.009,-.002)	LIFT3260
	CPRAT = CPRC1+(CPRC5-CPRC1)/4.*(ALOD -1.)	LIFT3270
	IF(RM.EQ.1.) CPRAT = CPRAT * 1.2	LIFT3280
1080	CONTINUE	LIFT3290
	IF(ITN .GT. 4) GO TO 1090	LIFT3300
	VSBL=VOLN/(RL1*SREF)	LIFT3310
	XD1B = RL1*(1.-VSBL)/D1*CPRAT	LIFT3320
	GO TO 1110	LIFT3330
1090	CONTINUE	LIFT3340
	VSBL=VOLN/(RL1*SREF)	LIFT3350
	XD1B = RL1*(1.-VSBL)/D1*CPRAT	LIFT3360
	IF (J .EQ. 1) WRITE(6,BUG)	LIFT3370
	GO TO 1110	LIFT3380
1100	CONTINUE	LIFT3390
C		LIFT3400
C	*****NOSE AND CYLINDER *** M.GE. 1.2 *****	LIFT3410
C		LIFT3420

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CALL RBYLPM (RM)
1110 CONTINUE
XD1RTL = 0.
IF (IRTL.EQ.0) GO TO 1130
IF (ITRIP.LE.0) GO TO 1120
C
C*****M .CE. 1.2 ***** BODY *** BOAT-TAIL *****
C
XD1RTL=0.62*RLD+RL2/D1
GO TO 1130
1120 CONTINUE
C
C*****M .LE. 0.9 AND MACH 1. ***** BODY **BCAT-TAIL *****
C
XD1RTL = RLD*(D1+2.*D)/(3.*(D1+D))+RL2/D1
IF ( J .EQ. 1 ) WRITE(6,BUG)
1130 CONTINUE
C
C***** SURFACES *** TAIL AND BODY/TAIL INT. *** ALL MACH MJLIFT
C
IF (NAERO(8).EQ.2) GO TO 1135
1135 CONTINUE
CALL PMOMNT(DMT,BDCT,TRT,RCT,RL4,BTANST,BAPT,BAPPT,XD1T,XD1BT,
1ATNS2T,RM)
XD1W = C.
XD1BW = 0.
IF (NW.NE.1) GO TO 1140
IF (NAERO(9).EQ.2) GO TO 1140
C
C***** SURFACES *** WING AND BODY/WING INT. *** ALL MACH MJLIFT
C
CALL PMOMNT(CMW,BDCW,TRW,RCW,RL5,BTANSW,BAPW,BAPPW,XD1W,XD1BW,
1ATNS2W,RM)
1140 CONTINUE
C
C***** C.P. OF INLET, ALREADY AVAILABLE FROM INLET S/R*****
C
XCP=0.0
XCP=XCP1
IF ( KSTEP .EQ. 1 ) XCP = XCGD1
C
C***** TOTAL CENTER OF PRESSURE *** ALL MACH. NUMBERS *****
C
1141 CONTINUE
XD1 = (CNANAC*XD1B+CNABTL*XD1BTL+CLAW*CKWB*XD1W*COSW+CLAW*CKBW*
1XD1BW*COSW+CLAT*CKTB*XD1T*COST+CLAT*CKBT*XD1BT*COST+CLAAWV*XD1T*
2 COST +CLAI*XCP)/CNA*DPR
IF ( NW .NE. 1 ) GO TO 2754
RLX=RL5 + D1
CALL PMOMNT(DMW,BDCW,TRW,RCW,RLX,BTANSW,BAPW,BAPPW,XDXW,
1XDXBW,ATNS2W,RM)
XD11= (CNANAC*XD1B+CNABTL*XD1BTL+CLAW*CKWB*XDXW*COSW+CLAW*CKBW*
1XDXBW*COSW+CLAT*CKTB*XD1T*COST+CLAT*CKBT*XD1BT*COST+CLAAWV*XD1T*
2 COST +CLAI*XCP)/CNA*DPR
2754 IF ( NW .NE. 1 ) XD11 = XD1
I = 24

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      IF(J.EQ.1) WRITE(6,1) I, Q1(1), Q2(73), XD1B, Q2(74), XD1RTL,
1 Q2(75), XD1T, Q2(76), XD1, Q2(77), XD1W, Q2(78), XD1BW
C
C****TOTAL PITCHING MOMENT AND DAMPING COEFFICIENT - ALL MACH NOS.****
C
      CMAR = (CNANAC*(XCGD1-XD1B)+CNABTL*(XCGD1-XD1RTL))*DPR
      CMAN = CLAI*(XCGD1-XCP)*DPR
      CMAT = ((CLAAWV+CLAT*CKTB)*COST*(XCGD1-XD1T)+CLAT*COST*CKBT*
1(XCGD1-XD1RT))*DPR
      CMAW = 0.
      CMANW = 0.
      CMDDOT = 0.
      CMADOT = 0.
      CLPW = 0.
      CMQ = 0.0
1150 IF (RW.EQ.0) GO TO 1160
      CMAW = (CLAW*COSW*CKWB*(XCGD1-XD1W)+CLAW*COSW*CKBW*(XCGD1-XD1BW))
1*DPR
      CMAW = (CLAW*COSW*CKWR+CLAW*COSW*CKBW)*DPR
      XQTM = (RL4+(5.*PCT-3.*TCT)/8.)/D1
      XQTMW = (RL5+(5.*PCW-3.*TCW)/8.)/D1
      CMADOT = 2.*CLAAWV*COST*(XCGD1-XQTM)*(XQTMW-XQTM)*DPR
      ARMYW = DMW/2.+BW*(RCW+2.*TCW)/(6.*(RCW+TCW))
C
C*** NEILSON ROLL DAMPING FACTORS ****
C
      PKRW = .59
      IF (RW.EQ.2) PKRW = 1.0
      IF (RW.EQ.3) PKRW = 1.41
      IF (RW.EQ.4) PKRW = 1.65
      CLPW = PKRW*ARMYW*(1.+BW/(2.*DMW))*CLAW*DPR/D1
1160 CMA = CMAR+CMAT+CMAW+CMAN
      ARMYT = DMT/2.+BT*(RCT+2.*TCT)/(6.*(RCT+TCT))
      PKRT = .59
      IF (RT.EQ.2) PKRT = 1.0
      IF (RT.EQ.3) PKRT = 1.41
      IF (RT.EQ.4) PKRT = 1.65
      CLPT = PKRT*ARMYT*(1.+BT/(2.*DMT))*CLAT*CLAAWV)*DPR/D1
      CLP = -1.*(CLPW+CLPT)
      SPAMP = PW/BTH
      IF (SPAMP.GT.1.5) GO TO 1170
      CMQ = -2.*(CNANAC*(XCGD1-XD1B)**2+CNABTL*(XCGD1-XD1RTL)**2+
1CLAAWV
1+CLAT*CKTB)*COST*(XCGD1-XD1T)**2+CLAT*COST*CKBT*(XCGD1-XD1RT)**2+
2 CLAW*COSW*CKWB*(XCGD1-XD1W)**2+CLAW*COSW*CKBW*(XCGD1-XD1BW)**2
3 +CLAI*(XCGD1-XCP)**2)*DPR
      GO TO 1180
1170 CMQ = -2.*(CNANAC*(XCGD1-XD1B)**2+CNABTL*(XCGD1-XD1RTL)**2+
1CLAT*CKTB)*COST*(XCGD1-XD1T)**2+CLAT*COST*CKBT*(XCGD1-XD1RT)**2+
2 CLAW*COSW*CKWB*(XCGD1-XD1W)**2+CLAW*COSW*CKBW*(XCGD1-XD1BW)**2
3 +CLAI*(XCGD1-XCP)**2)*DPR
1180 CONTINUE
      IF (ICNTPL.EQ.2) GO TO 1190
      COSE = 1.
      PK = 1.
      IF (IART.EQ.3) COSE = .866

```



```

IF (IART.EQ.2.OR.IART.EQ.5) PK = 9.0
IF (IART.EQ.3) PK=0.866
IF (IART.EQ.4) PK = 1.414
PKK = 1.
IF (IART.EQ.3) PKK=.866
IF (IART.EQ.4) PKK=.707
CHAT = (CLAT*CKTB+CLAAWV)*PKK*(RHLT-D1*XD1T)/RCT*SREF/SET*DPR
CHDT = (CLAT*SKTB+CLAAWV)*(RHLT-D1*XD1T)/RCT*SREF/SET*DPR
CMDT =PK*[( CLAT*SKTB)*(XCGD1-XD1T)+CLAT*SKBT*(XCGD1-
1 XD1RT))*DPR
DELALP=-CMA/CMDT
CPDEG=(57.296*CNDT-CNA*CMDT/CMA)*DYNP*SREF/WMISS/57.296/144.
CLATRM=CNA + 57.296*CNDT*DELALP
ALPTRM=(WMISS/(DYNP*SREF*CLATRM))*57.296*144.
DELTRM=ALPTRM*DELALP
PKRTD = .36+.007*RM+.06*(1.-TRT**2.5)
CLRD = (DPR*CLAT*SKTB*(DMT+BT*PKRTD)*RNT)/(4.*D1)
C
C*****COMPONENTS OF DAMPING TERMS*****
C
TERMA=(-2.*CNANAC*(XCGD1-XD1B)**2)*57.3
TERMB=(-2.*CNABTL*(XCGD1-XD1BTL)**2)*57.3
TERMC=(-2.*CLAT*CKTB*COST*(XCGD1-XD1T)**2)*57.3
TERMD=(-2.*(CLAAWV + CLAT*CKTB)*COST*(XCGD1-XD1T)**2)*57.3
TERME=(-2.*CLAT*COST*CKBT*(XCGD1-XD1BT)**2)*57.3
TERMF=(-2.*CLAW*COSW*CKWB*(XCGD1-XD1W)**2)*57.3
TERMG=(-2.*CLAW*COSW*CKBW*(XCGD1-XD1BW)**2)*57.3
TERMH=(-2.*CLAI*(XCGD1-XCP)**2)*57.3
C
C*****SYMMETRICAL CONFIGURATIONS ONLY*****
C*****CNR=CMQ MINUS WING CONTRIBUTION*****
CNR= TERMA + TERMB + TERMC + TERME + TERMH
C
C*****CNBETA=CMA MINUS WING CONTRIBUTION*****
TERMI=(CLAT*CKTB*COST*(XCGD1-XD1T) + CLAT*COST*CKBT*(XCGD1-XD1RT))
1*DPR
CNBETA=CMAB + CMAN + TERMI
C*****CYBETA=CNA MINUS WING CONTRIBUTION*****
CYBETA=(CNANAC + CNABTL + CLAI + (CLATB*COST))*DPR
I = 96
IF (J.NE.1) GO TO 1191
IF (J.EQ.1) WRITE(6,127) I,CMAB,CMAT,CMAW,CMA,CMQ,CMDT,
1 CLRD,PKRTD,CMO
WRITE(6,ROLL)
WRITE(6,SLCM)
GO TO 1191
1150 CONTINUE
COSE = 1.
IF (IARW.EQ.3) COSE = .866
IF (IARW.EQ.2) PK=1.0
IF (IARW.EQ.3) PK=0.866
IF (IARW.EQ.4) PK=1.414
PKK = 1.
IF (IARW.EQ.3) PKK=.866
IF (IARW.EQ.4) PKK=.707

```

LIFT4530
 LIFT4540
 LIFT4550
 LIFT4560
 LIFT4570
 LIFT4580
 LIFT4590
 LIFT4600
 LIFT4610
 LIFT4620
 LIFT4630
 LIFT4640
 LIFT4650
 LIFT4660
 LIFT4670
 LIFT4680
 LIFT4690
 LIFT4700
 LIFT4710
 LIFT4720
 LIFT4730
 LIFT4740
 LIFT4750
 LIFT4760
 LIFT4770
 LIFT4780
 LIFT4790
 LIFT4800
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 LIFT4830
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 LIFT4860
 LIFT4870
 LIFT4880
 LIFT4890
 LIFT4900
 LIFT4910
 LIFT4920
 LIFT4930
 LIFT4940
 LIFT4950
 LIFT4960
 LIFT4970
 LIFT4980
 LIFT4990
 LIFT5000
 LIFT5010
 LIFT5020
 LIFT5030
 LIFT5040
 LIFT5050
 LIFT5060
 LIFT5070

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CFAW = CLAW*PKK*CKWB*(RHLW-D1*XD1W)/RCW*SREF/SEW*DPR
CFDW = CLAW*SKWB*(RHLW-D1*XD1W)/RCW*SREF/SEW*DPR
CLDTWV = CLATWV*SKWB/CKWB*57.296
CMDW = PK*(CLAW*(SKWB*(XCGD1-XD1W)+SKPW*(XCGD1-XD1PW))+CLDTWV*
1(XCGD1-XD1T))*DPR
DELALP=-CMA/CMDW
CPDEC=(57.296*CNDW-CNA*CMDW/CMA)*DYNP*SREF/WMISS/57.296/144.
CLATRM=CNA + 57.296*CNDW*DELALP
ALPTRM=(WMISS/(DYNP*SREF*CLATRM))*57.296*144.
DELTRM=ALPTRM*DELALP
CMDDCT = PK*CLATWV*SKWB/CKWB*DPR*57.296
PKRWD = .36+.007*PM+.06*(1.-TRW**2.5)
PKRTD = .36+.007*PM+.06*(1.-TRT**2.5)
CLRD = DPR*(CLAW*SKWB*(DMW+BW*PKRWD)*RNW+CLDTWV*(DMT+BT*PKPTD)*
1RNT)/(4.*D1)
I = 98
IF (J.EQ.1) WRITE (6,127) I,CMA,CMAW,CMA,CMA,CMA,CMDW,
1 CLRD,PKPTD,CMO

```

1191 CONTINUE

```

ALDMAX=0.5*SQRT(CNA/CDCON)
CLOPT=SQRT(CNA*CDONN)
C3=D3SV
RETURN
END

```

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SUBROUTINE LIFT1(ARI,SEI,TRI,ATNS2I,BARI,AICLI,THKPI,XINI,SLFIR,
1 BTSL E,CNR,DELN,CLAT,PM)
COMMON/DRG/
1 D1 ,THETAC ,FINE ,RS ,RI ,RL1 ,
2 XCYL ,XTHERT ,XBT ,RL3 ,ITN ,AMACW ,
3 AMACT ,THKRT ,THKRW ,RL1A ,IBTL ,ATCT ,
4 ATCW ,DML ,ITSECT ,IWSECT ,RXINT ,RXINW ,
5 PTANST ,BTANSW ,RCW ,FLTSEW ,XLENW ,FLTSET ,
6 XLENT ,QRATIO ,DN ,DE ,D3 ,RCT ,
7 NW ,TCW ,TCT ,RT ,BW ,ART ,
8 APW ,TRT ,TRW ,SREF ,DR
COMMON/XXX/ AIC60(301),ATC61(301),CNR66(90),CNR67(42),
1XSP46(26),ANL47(28),ANL48(30),ANL49(30),SKK17(85),XAC78(219),
2XAC79(219),XACC18(85),XAC271(50),XAC28(177),XAC291(6)
COMMON/AA/CP37AL(45),CP314A(45),CP27AL(45),CP214A(45),XCPBFN(36),
4XCPBPP(36),XCP74(133),XCP64(45),XCP65(45),XCP75(133),CNA21(90),
5CNA22(78),CNA23(105),CNA24(77),VOLRA(78),EKFRB(34)
A,CNA72(152),CNA73(152)
COMMON/LET/
1 ATNS2T ,ATNS2W ,SFW ,SET ,DMW ,DMT ,
2 RL4 ,RL5 ,ALPHAR ,RITWV ,IART ,ICNTRL ,
3 D2 ,RL2
COMMON/AERO/
1 ATNS4T ,ATNS4W ,BTANA ,BART ,BARW ,BAPT ,
2 BAPW ,BAPPT ,BAPPW ,BETA ,BFN ,CFT ,
3 CFW ,CDB ,CFB ,CNANAC ,CLABT ,CLAT ,
4 CLAW ,CLTV ,CKWB ,CKBW ,CKBT ,CKTB

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5  CLATWV ,D ,DD ,DD2 ,DPR ,DHL , LIF10280
6  FAFN ,F ,FL ,FR ,PI ,RLD , LIF10290
7  PLDR ,RBTANA ,SLETR ,SLEWR ,STSREF ,SWSREF , LIF10300
8  SKRT ,SKTR ,SKBW ,SKWB ,TRTP1 ,TRWP1 , LIF10310
9  CFI ,TANST ,TANSW ,TANS4T ,TANS4W ,TANS2T , LIF10320
A  TANS2W ,XD1B ,XD1BT ,XD1T ,XD1W ,XNLCMB , LIF10330
R  XNLCER ,ACT ,ACW ,XNLCLE ,BODYL ,TAILL , LIF10340
  DIMENSION X(3), NINV(3) LIF10350
  DIMENSION TABLE(14) LIF10360
  REAL KM, KAR LIF10370
  DATA TABLE/0., 1.57, 1., 1.57, 2., 1.57, 3., 1.246, 4., 1.040, LIF10380
1  5., .90, 6., .80/ LIF10390
  DPR = 57.2958 LIF10400
  J=1 LIF10410
  CON1 = ARI*SFI/(DPR*SREF) LIF10420
  CNR = 1.0 LIF10430
  IF (RM.EQ.1.) GO TO 120 LIF10440
  X(1) = TRI LIF10450
  X(2) = ATNS2I LIF10460
  X(3) = BARI LIF10470
  NVAR = 3 LIF10480
  NINV(1) = 4 LIF10490
  NINV(2) = 7 LIF10500
  NINV(3) = 10 LIF10510
  IF (RM.LT.1.) GO TO 100 LIF10520
  IF (BARI.GT.7.) X(3)=7. LIF10530
  CALL FASTF(NVAR,NINV,AIC61(1),X,AICLI) LIF10540
  GO TO 105 LIF10550
100 CONTINUE LIF10560
  IF (BARI .LE.7.) GO TO 101 LIF10570
  X(3) = 7.0 LIF10580
101 CALL FASTF(NVAR,NINV,AIC60(1),X,AICLI) LIF10590
105 CONTINUE LIF10600
  IF (BARI .LE.7.) GO TO 130 LIF10610
  IF (BARI .GT.10.) GO TO 110 LIF10620
  AICLI = AICLI+(.38-AICLI)/3.*(BARI -7.) LIF10630
  GO TO 130 LIF10640
110 AICLI = .38-.029*(BARI -10.) LIF10650
  GO TO 130 LIF10660
120 CALL LINE(7,ATNS2I,TABLE(1),AICLI) LIF10670
120 CLAI = AICLI*CON1 LIF10680
  CDFL = ATAN(THKRI/(XINI+XINI)) LIF10690
  IF (ITSECT.NE.2.OR.BART.NE.BARI) GO TO 131 LIF10700
  THICK = THKRT * RCT LIF10710
  RAD1 = THICK/4.+((RCT/2.)**2)/THICK LIF10720
  RADIP = SQRT(RAD1**2-(.25*RCT)**2) LIF10730
  TPRIME = THICK/2.-RAD1+RADIP LIF10740
  CDFL = ATAN(TPRIME/(.25*RCT)) LIF10750
121 CONTINUE LIF10760
  IF (IWSECT.NE.2.OR.BARW.NE.BARI) GO TO 132 LIF10770
  IF ( NW .EQ. 0 ) GO TO 132 LIF10780
  THICK = THKRW * RCW LIF10790
  RAD1 = THICK/4.+((RCW/2.)**2)/THICK LIF10800
  RADIP = SQRT(RAD1**2-(.25*RCW)**2) LIF10810
  TPRIME = THICK/2.-RAD1+RADIP LIF10820

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	DDEL = ATAN(TPRIME/(.25+RCW))	LIF10830
132	CONTINUE	LIF10840
	DELN = DPR*DDEL/COS(SLEIR)	LIF10850
	IF (RM.LE.1.) GO TO 160	LIF10860
	IF(RM.LT.1.0) GO TO 160	LIF10870
	IF (ARI.LT.1.0.AND.RM.GE.1.0) GO TO 155	LIF10880
	IF(RM.EQ.1.0) GO TO 160	LIF10890
	PTVAL = BTSLE	LIF10900
	IF(PTSLE.GT.1.0) GO TO 140	LIF10910
	CALL PLINF(6,7,CNR66(1),DELN,BTVAL,CNR)	LIF10920
	GO TO 150	LIF10930
140	PTVAL = 1.0/BTSLE	LIF10940
	CALL PLINF(6,3,CNR67(1),DELN,BTVAL,CNR)	LIF10950
150	IF (CNR.GT.1.0) CNR=1.0	LIF10960
	CLAI = CLAI*CNR	LIF10970
	GO TO 160	LIF10980
155	CONTINUE	LIF10990
	IF(RM.GE.1.0.AND.RM.LE.1.65) KM = .35+1.*(RM-1.)	LIF11000
	IF(RM.GT.1.65.AND.RM.LE.2.1) KM = 1.0	LIF11010
	IF(RM.GT.2.1.AND.RM.LE.3.65) KM = 1.-.515*(RM-2.1)	LIF11020
	IF(RM.GT.3.65.AND.RM.LE.5.0) KM = .2-.148*(RM-3.65)	LIF11030
	IF(RM.GT.5.) KM = 0.	LIF11040
	KAR = -.2468+.2463/ARI	LIF11050
	CLAI = CLAI*(1.0+KM*KAR)	LIF11060
160	CONTINUE	LIF11070
	RETURN	LIF11080
	END	LIF11090

	SUBROUTINE MAINS	MANS0010
C	NUK.CM-CGSM R.K.MCDONOUGH FIV/EBCD 10/18/73	MANS0020
C	SUBROUTINE MAINS PERFORMS THESE FUNCTIONS AT THE START OF EACH	MANS0030
C	PHASE--	MANS0040
C	(1) PUTS INPUT PHASE DATA INTO WORKING LOCATIONS	MANS0050
C	(2) PERFORMS INITIALIZATION OF CERTAIN VARIABLES	MANS0060
C	(3) CONTROLS ITERATION TO FIND CRUISE RANGE WHICH EXHAUSTS	MANS0070
C	FUEL AT THE END OF THE TRAJECTORY	MANS0080
C	(4) PUTS TABULAR DATA INTO TABLE LOOK-UP ARRAYS	MANS0090
C	(5) CONSTRUCTS CLIMB SCHEDULE FOR CLIMB PHASES IF MHGEN=1	MANS0100
C	(6) CALLS RUNGE K TO INITIATE INTEGRATION OF EACH PHASE	MANS0110
C	MAINS RETURNS CONTROL TO STDATA AT THE END OF THE LAST PHASE	MANS0120
C	INPUT GENERAL DATA STDATA MAINS DERI/	MANS0130
	COMMON /FAILUR/ KFAIL	MANS0140
	COMMON/NEWVPM/ VPM102(102)	MANS0150
	EQUIVALENCE(VPM102(1), DALPIN)	MANS0160
	COMMON /ROUND/ PRNG(20), RUF23(23)	MANS0170
	COMMON/CIBLK/CI(1000)/BCDBLK/LINE1(20), LINE2(20)	MANS0180
C	INPUT GENERAL DATA NAMES	MANS0190
	EQUIVALENCE	MANS0200
1	(VELI, CI(1)), (XMACHI, CI(2)), (GAMMAI, CI(3)),	MANS0210
2	(ALTI, CI(4)), (TIMEI, CI(5)), (RANGEI, CI(6)),	MANS0220
3	(MOPT, CI(7)), (WTI, CI(8)), (MXSTEP, CI(9)),	MANS0230
4	(DSTART, CI(10)), (DMIN, CI(11)), (EREF, CI(12)),	MANS0240
5	(EPRFAC, CI(13)), (DELMAX, CI(14)), (DALPH, CI(15)),	MANS0250

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*          (DALPH, DFCO(1)), MANS0260
6  (DALT, CI(16)), (DMACH, CI(17)), (DCFN, CI(18)), MANS0270
7  (DVCL, CI(19)), (DHCL, CI(20)), (NTRY, CI(21)), MANS0280
8  (JPRINT, CI(22)), (SAVE, CI(23)), (IPRNT2, CI(24)), MANS0290
9  (GSTO, CI(25)), (RE, CI(26)), (NLPHAZ, CI(27)), MANS0300
*  (NCPHAZ, CI(28)), (NDPHAZ, CI(29)), (WDROP, CI(30)), MANS0310
1  (FSTART, CI(31)), (AEXITI, CI(32)), (TVACI, CI(33)), MANS0320
2  (XISPI, CI(34)), (WPROPB, CI(35)), (WPROPS, CI(36)), MANS0330
3  (AEXITS, CI(37)), (IPROP1, CI(38)), (RTOL, CI(39)), MANS0340
4  (TVACMX, CI(40)), (TVACMN, CI(41)), (NSETS, CI(42)), MANS0350
5  (SREF, CI(43)), (XTHRTL, CI(61)), (YISP, CI(81)), MANS0360
*  (LINOUT, CI(45)) MANS0370
EQUIVALENCE MANS0380
1  (SMACH1, CI(101)), (CLALF1, CI(121)), MANS0390
*  (SMACH1, SMACH), MANS0400
2  (SMACH2, CI(141)), (CLALF2, CI(161)), MANS0410
3  (SMACH3, CI(181)), (CLALF3, CI(201)), MANS0420
4  (SMACH4, CI(221)), (CLALF4, CI(241)), MANS0430
5  (SMACH5, CI(261)), (CLALF5, CI(281)), MANS0440
6  (DMACH1, CI(302)), (CDO1, CI(321)), MANS0450
7  (DMACH2, CI(422)), (CDO2, CI(441)), MANS0460
8  (DMACH3, CI(542)), (CDO3, CI(561)), MANS0470
9  (DMACH4, CI(662)), (CDO4, CI(681)), MANS0480
*  (DMACH5, CI(782)), (CDO5, CI(801)) MANS0490
C  INPUT PHASE DATA STDATA MAINS DERIV MANS0500
COMMON/PIBLK/PI(70)/IPBLK/IP(10)/PSBLK/PS(70,20)/IPBLK/IPS(10,20) MANS0510
C  INPUT PHASE DATA NAMES MANS0520
C  EQUIVALENCE MANS0530
1  (XMACHF, PI(1)), (ALTF, PI(2)), (GAMMAF, PI(3)), MANS0540
2  (TPHASE, PI(4)), (TTOTAL, PI(5)), (FVALUE, PI(6)), MANS0550
3  (SLOPF, PI(7)), (ALPMAX, PI(8)), (ANZMAX, PI(9)), MANS0560
4  (DPRINT, PI(10)), (CANT, PI(11)), (GTOPT, PI(12)), MANS0570
5  (GKV, PI(13)), (GKG, PI(14)), (GKVCUR, PI(15)), MANS0580
6  (XPITCH, PI(21)), (YPITCH, PI(41)), MANS0590
7  (ITERM, IP(1)), (NAERO, IP(2)), (IPTYPE, IP(3)), MANS0600
8  (MODES, IP(4)), (MHGEN, IP(5)), (ICONT, IP(6)) MANS0610
C  WORKING COMMON STDATA, MAINS, DERIV, OUTPUT MANS0620
COMMON/CPK/C(400)/OUTBLK/PAGEB(12,50) MANS0630
EQUIVALENCE MANS0640
1  (RC, C(1)), (Q, C(2)), (QS, C(3)), MANS0650
2  (GRAV, C(4)), (GRAVT, C(5)), (GRAVN, C(6)), MANS0660
3  (TWOG, C(7)), (THR, C(8)), (THRQ, C(9)), MANS0670
4  (SSV, C(10)), (RHO, C(11)), (PRESS, C(12)), MANS0680
5  (VISC, C(13)), (TEMP, C(14)), (ALPHA, C(15)), MANS0690
6  (XMACH, C(16)), (CDO, C(17)), (CLAQS, C(18)), MANS0700
7  (CLALF, C(19)), (CF, C(20)), (WF, C(21)), MANS0710
8  (SFC, C(22)), (TT4, C(23)), (ANZ, C(24)), MANS0720
9  (ANX, C(25)), (NITER, C(26)), (NBOOST, C(27)), MANS0730
*  (NSPHAZ, C(28)), (IPRINT, C(29)), (RSAVE, C(30)), MANS0740
1  (ETA, C(31)), (TSAVE, C(32)), (XTOL, C(33)), MANS0750
2  (NERR, C(34)), (ERLIMT, C(35)), (NEQ, C(36)), MANS0760
3  (IDONE, C(37)), (NDONE, C(38)), (ERLOG, C(39)), MANS0770
4  (NBAO, C(40)), (JSTEP, C(41)), (TTOL, C(42)), MANS0780
5  (TMAX, C(43)), (DELT, C(44)), (KSUB, C(45)), MANS0790

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7          (KKK,      C( 56)), (INDEX,  C( 57))      MANS0810
EQUIVALENCE                                         MANS0820
1  (TOUT,      C( 58)), (IOUT,      C( 59)), (NPHAZ,  C( 60)), MANS0830
2  (SINGAM,    C( 73)), (COSGAM,    C( 74)), (DALP,    C( 75)), MANS0840
3  (VMAS,      C( 76)), (GDOTRQ,    C( 77)), (DEGRAD,  C( 78)), MANS0850
4  (TVAC,      C( 79)), (AFEXIT,    C( 80)), (XISP,    C( 81)), MANS0860
5  (ACCN,      C( 82)), (ACCT,      C( 83)), (XNCW,    C( 84)), MANS0870
6  (WPR,       C( 85)), (WEMPTY,    C( 86)), (NPAGE,    C( 87)), MANS0880
7  (NOUT,      C( 88)), (NLINES,    C( 89)), (NCON,     C( 90)), MANS0890
8  (NMAP,      C( 91)), (RNGI,      C( 92)), (NTRY,     C( 93)), MANS0900
9  (ALTMAX,    C( 94)), (GAMOLD,    C( 95)), (HOLD,     C( 96)), MANS0910
*          (ISV(1),  C(101)), (STLU(1), C(141))      MANS0920
C  INTEGRATION VARIABLES  STDATA  MAINS  DERIV, OUTPUT MANS0930
REAL*8 XPRIM1                                         MANS0940
REAL*8 XSV(10)                                         MANS0950
COMMON/RKBLK/X(10),XDOT(10),XPRIM1(10)               MANS0960
EQUIVALENCE                                         MANS0970
1  (TIME,      X( 1)), (GAMMA,     X( 2)), (V,        X( 3)), MANS0980
2  (ALT,       X( 4)), (R,         X( 5)), (W,        X( 6)), MANS0990
3  (VI,        X( 7)),                                         MANS1000
4          (GDOT,      XDOT(2)), (VDOT,      XDOT(3)), MANS1010
5  (HDOT,      XDOT(4)), (RDOT,      XDOT(5)), (WDOT,    XDOT(6)), MANS1020
6  (VIDOT,     XDOT(7))                                         MANS1030
C  ATMOSPHERE SUBROUTINE COMMUNICATION  DERIV,STDATA,MAINS MANS1040
COMMON/AIRBLK/ALTA,  TEMPA,  RHOA,  PRESSA,  SSVA, MANS1050
1  VISCA                                         MANS1060
C                                         MANS1070
COMMON/TRAJX/CFP,CFROP,XMACHP, ALPHAP, IMODES, IND, DUM2(4) MANS1080
DIMENSION                                         MANS1090
1  YISP(20),          XTHRTL(20), MANS1100
8          XPITCH(20),          YPITCH(20), MANS1110
9  DECO(4),          STLU(20,6), ISV(12) MANS1120
DIMENSION  HCLS(21), HDOTA(3), VCLA(3), SPACH(20,10) MANS1130
C                                         MANS1140
C                                         MANS1150
C                                         MANS1160
9876 CONTINUE MANS1170
C                                         MANS1180
C**** CONTROL IS RETURNED TO THIS POINT AT THE END OF EACH PHASE***** MANS1190
C  COMPUTE SPECIFIC RANGE AT THE END OF THE CRUISE PHASE (FT/LB) MANS1200
IF( NPHAZ .EQ. NCPHAZ ) DRDW= V*COSGAM /ABS(WDOT+1.E-10) MANS1210
1                                         /6076.115 MANS1220
C                                         MANS1230
C  PRNG(NPHAZ) = R MANS1240
C  TEST FOR COMPLETION OF LAST PHASE OF TRAJECTORY MANS1250
IF( NPHAZ .LT. NLPHAZ ) GO TO 200 MANS1260
C  PRINT TABLE B  OUTPUT AT THE END OF THE TRAJECTORY. MANS1270
NOUT=0 MANS1280
CALL OUTPUT MANS1290
NLINES=0 MANS1300
C  IF ITERATION TO SATISFY FUEL EXHAUSTION IS NOT UNDER WAY, RETURN MANS1310
C  CONTROL TO STDATA MANS1320
IF ( NITER .EQ. 0 ) KFAIL=50 MANS1330
IF ( NITER .EQ. 0 ) RETURN MANS1340
C  TEST FOR ITERATION CONVERGENCE. MANS1350

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DRNG= (W-WEMPTY)*DRDW	MANS1360
IF(ABS(DRNG) .LE. RTOL) GO TO 110	MANS1370
IF(NTRY .LT. NTPYS) GO TO 120	MANS1380
IFAIL=1	MANS1390
110 NITER=0	MANS1400
IPRINT=1	MANS1410
120 CONTINUE	MANS1420
DO 130 I=1,7	MANS1430
130 XPRIM1(I)=XSV(I)	MANS1440
NPHAZ=NCPHAZ	MANS1450
RNGI=RNGI+DRNG	MANS1460
IF(RNGI .GT. 0.) GO TO 136	MANS1470
NX=NX+1	MANS1480
IF(NX .LT. 2) GO TO 136	MANS1490
IF (LINDT .NE. 0) WRITE (6,135)	MANS1500
135 FORMAT(// ' ERROR DETECTED IN VEHPER MAINS SUBROUTINE. VARIABLE	MANS1510
*LENGTH CRUISE LEG WAS NEGATIVE ON SUCCESSIVE ITERATIONS' /	MANS1520
* ' FAILURE WAS PROBABLY DUE TO INSUFFICIENT FUEL')	MANS1530
CALL ERRDUT	MANS1540
IF (KFAIL .GT. 0) RETURN	MANS1550
136 CONTINUE	MANS1560
WPR=W-WEMPTY	MANS1570
IF (LINDT .NE. 0) WRITE (6,140) DRNG,DRDW,WPR,RNGI	MANS1580
140 FORMAT(// ' D RANGE=',F10.2,' , DRDW=', F10.5, ' , W-WEMPTY=',F9.2,	MANS1590
1 ' , RNGI=', F10.2, 'NMI' //)	MANS1600
GO TO 210	MANS1610
C	MANS1620
C	MANS1630
C	MANS1640
C	MANS1650
ENTRY MAINS1	MANS1660
C MAINS1 IS ENTRY POINT FOR CALLS FROM STDATA AT THE START OF TRAJ.	MANS1670
NX=0	MANS1680
200 NPHAZ=NPHAZ+1	MANS1690
C	MANS1700
C PUT XPRIM1 ARRAY INTO X ARRAY IN CASE THIS IS THE FIRST PHASE	MANS1710
210 CONTINUE	MANS1720
DO 215 I=1,10	MANS1730
215 X(I)=XPRIM1(I)	MANS1740
C	MANS1750
C PUT PHASE DATA INTO WORKING LOCATIONS	MANS1760
DO 220 I=1,70	MANS1770
220 PI(I)= PS(I,NPHAZ)	MANS1780
DALPH=DALPIN	MANS1790
ALPTES=ABS(ALPMAX) /DEGRAD	MANS1800
IF(DALPH.GT.ALPTES) DALPH=ALPTES	MANS1810
DO 230 I=1,10	MANS1820
230 IP(I)=IPS(I,NPHAZ)	MANS1830
C	MANS1840
C INITIALIZE PATH ANGLE TO ZERO VALUE FOR CRUISE PHASE (ICONT=13)	MANS1850
C ALSO INSURE THAT SUSTAINER MODE IS ZERO (THROTTLEABLE) FOR	MANS1860
C CRUISE AND TRANSITION PHASES.	MANS1870
IF(ICONT - 13) 233, 231, 232	MANS1880
231 XPRIM1(2)=0.00	MANS1890
232 MDES=0	MANS1900

233	CONTINUE	MANS1910
C		MANS1920
C	DO ONCE-PER-PHASE INITIALIZATION OF CONSTANTS	MANS1930
	TSAVE=TIME	MANS1940
	RSAVE=R/6076.115	MANS1950
	NDONE=1	MANS1960
	INDEX=0	MANS1970
	TCUT=0.	MANS1980
	IF(ALPMAX .EQ. 0.) ALPMAX=10.	MANS1990
	ALPMAX=ALPMAX/DEGRAD	MANS2000
	IF(ANZMAX .EQ. 0.) ANZMAX=3.	MANS2010
C	INITIALIZE TABLE LOOK-UP INDICES	MANS2020
	DO 250 I=1,12	MANS2030
250	ISV(I)=1	MANS2040
	CUM=DSL IN(DUMDUM)	MANS2050
	ETA=CANT/DEGRAD	MANS2060
C	SAVE TRAJ. STATE AT START OF FIRST ITERATIVE SEGMENT	MANS2070
	IF(NPHAZ .NE. NCPHAZ .OR. NTRY .NE. 0) GO TO 270	MANS2080
	DO 260 I=1,7	MANS2090
260	XSV(I)=XPRIM1(I)	MANS2100
270	CONTINUE	MANS2110
	IF(TPHASE .EQ. 0) TPHASE=1.E4	MANS2120
	IF(TTOTAL .EQ. 0) TTOTAL=1.E4	MANS2130
	TMAX= AMIN1(TPHASE+TIME, TTOTAL)	MANS2140
	TTOL= AMAX1(TMAX*1.E-6, 0.001)	MANS2150
	THR=0.	MANS2160
	ALPHA=0.	MANS2170
	TVAC=0.	MANS2180
	XISP=0.	MANS2190
	SFC=0.	MANS2200
	WF=0.	MANS2210
	TT4=0.	MANS2220
	IMODES=MODES	MANS2230
	GAMOLD=0.	MANS2240
	ACCN=0.	MANS2250
	HOLD=0.	MANS2260
	THRQ=0.	MANS2270
C		MANS2280
C	CHECK FOR LEGAL VALUE OF NAERO	MANS2290
	IF(NAERO .GT. 0 .AND. NAERO .LE. 5) GO TO 290	MANS2300
	IF (LINDUT .NE. 0) WRITE (6,280) NAERO, NPHAZ	MANS2310
280	FORMAT(// ' NAERO=',I2, ' IN PHASE',I3)	MANS2320
5000	CALL FRRQUT	MANS2330
	IF (KFAIL .GT. 0) RETURN	MANS2340
C		MANS2350
290	CONTINUE	MANS2360
C	DROP WEIGHT IF REQUESTED	MANS2370
	IF(NPHAZ .NE. NCPHAZ) GO TO 300	MANS2380
	W=W-WDROP	MANS2390
	XPRIM1(6)=0.00	MANS2400
	XPRIM1(6)=W	MANS2410
300	CONTINUE	MANS2420
C		MANS2430
C	COMPUTE INITIAL INTEGRATION STEP SIZE AND FIRST PRINT-OUT TIME	MANS2440
	DELT= AMIN1(TMAX-TIME, DSTART)	MANS2450

IF(DPRINT .EQ. 0.) GO TO 310	MANS2460
TOUT= DPRINT*(AINT(TIME/DPRINT) +1.)	MANS2470
IF(ABS(TOUT-TIME)-TTOL .LE.0.) TOUT= DPRINT +TIME	MANS2480
DELT= AMIN(DELT, TOUT-TIME)	MANS2490
IF(DELT.LT.0.0)CALL ERROUT	MANS2500
IF(DELT.LT.0.0)RETURN	MANS2510
310 CONTINUE	MANS2520
C	MANS2530
C SET ROCKET ENGINE PARAMETERS	MANS2540
IF(IPTYPE-?) 317, 316, 318	MANS2550
316 AEXIT= AEXITS	MANS2560
IF(TVACMX-TVACMN .NE. 0.) GO TO 319	MANS2570
IF (LINCUT .NE. 0) WRITE (6,3160)	MANS2580
3160 FORMAT(// ' ILLEGAL INPUT. TVACMX-TVACMN=0 IN ROCKET SUSTAINER	MANS2590
*PHASE')	MANS2600
CALL ERROUT	MANS2610
IF (KFAIL .GT. 0) RETURN	MANS2620
317 IF(IPTYPE .EQ. 0) GO TO 318	MANS2630
AEXIT=AEXITI	MANS2640
TVAC=TVACI	MANS2650
XISP=XISPI	MANS2660
IF(XISP .NE. 0.) GO TO 319	MANS2670
IF (LINCUT .NE. 0) WRITE (6,3170)	MANS2680
3170 FORMAT(// ' ROCKET ENGINE SPECIFIC IMPULSE IS ZERO IN BOOST PHASE	MANS2690
* ')	MANS2700
CALL ERROUT	MANS2710
IF (KFAIL .GT. 0) RETURN	MANS2720
318 AEXIT=0.	MANS2730
319 CONTINUE	MANS2740
C	MANS2750
C START BOOSTER SEGMENT IF REQUESTED	MANS2760
IF(NPHAZ .NE. NBOOST) GO TO 320	MANS2770
WEMPTY=W-WPROPB	MANS2780
WFULL=W	MANS2790
320 CONTINUE	MANS2800
C	MANS2810
C START SUSTAINER SEGMENT IF REQUESTED	MANS2820
IF(NPHAZ .NE. NSPHAZ) GO TO 325	MANS2830
WEMPTY= W-WPROPS	MANS2840
WFULL=W	MANS2850
325 CONTINUE	MANS2860
C	MANS2870
C START ITERATIVE SEGMENT IF REQUIRED	MANS2880
IF(NPHAZ .NE. NCPHAZ) GO TO 360	MANS2890
IF(NITER .EQ. 0) GO TO 340	MANS2900
IF(IPRNT2) 330,330,340	MANS2910
330 CONTINUE	MANS2920
IF(NTRY .GT. 0) GO TO 332	MANS2930
NCUT=0	MANS2940
CALL OUTPUT	MANS2950
332 IPRINT=0	MANS2960
GO TO 350	MANS2970
340 CONTINUE	MANS2980
IPRINT=1	MANS2990
350 CONTINUE	MANS3000

ITEM=4	MANS3010
FVALUE=RNIG	MANS3020
NTRY=NTRY+1	MANS3030
360 CONTINUE	MANS3040
C	MANS3050
C CHECK FOR LEGAL VALUES OF ICONT	MANS3060
IF(ICONT .GT. 0 .AND. ICONT .LT. 15) GO TO 380	MANS3070
IF (LINDOUT .NE. 0) WRITE (6,370) ICONT, NPHAZ	MANS3080
370 FORMAT(// ' ILLEGITIMATE VALUE OF OF ICONT. ICCNT=', I3,	MANS3090
1 ' IN PHASE', I3)	MANS3100
GO TO 9000	MANS3110
380 CONTINUE	MANS3120
IF(NPHAZ .NE. NCPHAZ) GO TO 382	MANS3130
IF(ICONT .EQ. 13) GO TO 382	MANS3140
IF (LINDOUT .NE. 0) WRITE (6,381)	MANS3150
381 FORMAT(// ' ERROR AT START OF VARIABLE LENGTH CRUISE PHASE.	MANS3160
* ICONT IS NOT EQUAL TO 13.')	MANS3170
CALL ERROUT	MANS3180
IF (KFAIL .GT. 0) RETURN	MANS3190
382 CONTINUE	MANS3200
C	MANS3210
C CHECK FOR LEGAL VALUE OF ITEM	MANS3220
IF (ITEM .GE. 0 .AND. ITEM .LT. 10) GO TO 400	MANS3230
IF (LINDOUT .NE. 0) WRITE (6,390) ITEM, NPHAZ	MANS3240
390 FORMAT(// ' ILLEGITIMATE VALUE OF ITEM. ITEM=', I3,	MANS3250
1 ' IN PHASE', I3)	MANS3260
GO TO 9000	MANS3270
400 CONTINUE	MANS3280
C	MANS3290
C PUT TABULAR DATA INTO TABLE LOOK-UP ARRAYS. CONVERT ANGLES TO	MANS3300
C RADIANS	MANS3310
DO 410 J=1,6	MANS3320
DO 410 I=1,20	MANS3330
410 STLU(I,J)=0.	MANS3340
DO 420 I=1,20	MANS3350
STLU(I,4)=YPITCH(I)	MANS3360
IF(ICONT .LE. 8) STLU(I,4)=YPITCH(I)/DEGRAD	MANS3370
420 CONTINUE	MANS3380
NAER2=2*NAERO-1	MANS3390
DO 430 I=1,20	MANS3400
STLU(I,1)=SMACH(I, NAER2)	MANS3410
STLU(I,2) = SMACH(I, NAER2+1) * DEGRAD	MANS3420
STLU(I,3)=XPITCH(I)	MANS3430
STLU(I,5)=XTHRTL(I)	MANS3440
STLU(I,6)=YISP(I)	MANS3450
430 CONTINUE	MANS3460
C	MANS3470
C INSURE THAT EXIT AREA IS ZERO DURING COAST PHASE	MANS3480
IF(IPTYPE .EQ. 0) AEXIT=0.	MANS3490
C	MANS3500
C	MANS3510
C COMMAND ENGINE TO OPERATE AT MAXIMUM THRUST DURING ECCST PHASES	MANS3520
IF(IPTYPE .LT. 3) MODES=1	MANS3530
C	MANS3540
C CHECK FOR LEGAL VALUES OF PROPULSION SYSTEM TYPE	MANS3550

IF(IPTYPE .GE. 0 .AND. IPTYPE .LE. 5) GO TO 440	MANS3560
IF (LINDUT .NE. 0) WRITE (6,435) IPTYPE,NPHAZ	MANS3570
435 FORMAT(// ' ILLEGITIMATE VALUE OF IPTYPE. IPTYPE=', I3,	MANS3580
1 ' IN PHASE', I3)	MANS3590
GO TO 9000	MANS3600
440 CONTINUE	MANS3610
C	MANS3620
C	MANS3630
C	MANS3640
C	MANS3650
IF(MFCEN .EQ.0) GO TO 800	MANS3660
C GENERATE CLIMB SCHEDULE FOR MAX RATE OF CLIMB(R/C). SEARCH FOR	MANS3670
C MAX R/C AT EACH ALTITUDE TERMINATES WHEN 3 POINTS ON CURVE	MANS3680
C HAVE BEEN FOUND AND POINT 2 R/C IS GREATER THAN R/C AT POINTS	MANS3690
C 1 OR 3.	MANS3700
VMASS=W/GSTD	MANS3710
IMODES=1	MANS3720
IPSV=IPROP1	MANS3730
IPROP1=1	MANS3740
DHCL = ABS(ALTF - ALT) / 10.	MANS3750
HCLS(1)=DHCL* AINT(ALT/DHCL)	MANS3760
ALPC=0.01	MANS3770
NALTS=(ALTF-HCLS(1))/ DHCL +2.1	MANS3780
IF(NALTS .GT. 2 .AND. NALTS .LE. 20) GO TO 460	MANS3790
IF (LINDUT .NE. 0) WRITE (6,450) NALTS	MANS3800
450 FORMAT(// ' ERROR IN CLIMB SCHEDULE GENERATION. NUMBER OF ALT	MANS3810
ITUDES DEFINED=', I3)	MANS3820
GO TO 9000	MANS3830
C	MANS3840
C	MANS3850
C**** START ALTITUDE DO LOOP*****	MANS3860
460 CONTINUE	MANS3870
IF (LINDUT .NE. 0) CALL PAGE	MANS3880
DO 700 I=1,NALTS	MANS3890
RC= HCLS(I)+RE	MANS3900
ALTA=HCLS(I)	MANS3910
CALL AIR	MANS3920
IF (KFAIL .GT. 0) RETURN	MANS3930
TEMP =TFMPA	MANS3940
PRESS=PRESSA	MANS3950
VMAX=XMACHF*SSVA	MANS3960
DVCL=ABS(DVCL)	MANS3970
IF(I .GT. 1) GO TO 462	MANS3980
VMIN= AMAX1(0.5*VMAX, V)	MANS3990
VCL=AINT(VMIN/DVCL)*DVCL +DVCL	MANS4000
VCLS=V	MANS4010
ALTA=ALT	MANS4020
CALL AIR	MANS4030
IF(KFAIL.GT.0) RETURN	MANS4040
GO TO 680	MANS4050
462 CONTINUE	MANS4060
C	MANS4070
C START CLIMB SPEED SEARCH	MANS4080
VCLZ=AINT(VCL/DVCL) * DVCL + DVCL	MANS4090
IF (VCLZ .LT. VMAX) VCL = VCLZ	MANS4100

DO 600 J=1,20	MANS4110
XMACH=VCL/SSVA	MANS4120
CLALPH=SLINE(XMACH,1,2)	MANS4130
CDQ=DSLINF(XMACH,ALTA,NAERO)	MANS4140
QS=0.5*RHOA*VCL*VCL*SREF+1.E-10	MANS4150
CDQQS=CDQ*QS	MANS4160
CLAQS=CLALPH*QS	MANS4170
DALPC=1.	MANS4180
C	MANS4190
C AT THE GIVEN MACH NO. AND ALTITUDE, FIND THE CLIMB ANGLE AND	MANS4200
C ANGLE OF ATTACK	MANS4210
DO 500 K=1,20	MANS4220
NALP=K	MANS4230
IF(DALPC .LT. 0.002) GO TO 465	MANS4240
ALPHA =ALPC	MANS4250
CALL TPROP1	MANS4260
IF (KEAIL .GT. 0) RETURN	MANS4270
465 CONTINUE	MANS4280
THR=THP	MANS4290
DRAG= CDQQS+ CLAQS*ALPC*ALPC	MANS4300
SINGAM=(THR *COS(ALPC)- DRAG)/W	MANS4310
COSGAM= SQRT(ARS(1.-SINGAM*SINGAM))	MANS4320
ALPC1= VMAS*(GSTD -VCL*VCL/RC) *COSGAM /	MANS4330
1 (THR + CLAQS)	MANS4340
DALPC= ARS(ALPC-ALPC1)	MANS4350
IF(DALPC -0.0001) 530,530,470	MANS4360
470 ALPC=ALPC1	MANS4370
500 CONTINUE	MANS4380
C END OF DO LOOP FOR ALPHA SOLUTION	MANS4390
C	MANS4400
C	MANS4410
C NORMAL EXIT FROM ALPHA DO LOOP SIGNIFIES ERROR	MANS4420
IF (LINOUT .NE. 0) WRITE (6,520)	MANS4430
520 FORMAT(// ' FAILURE IN MAINS CLIMB SCHEDULE GENERATION. ANGLE OF	MANS4440
1 IF ATTACK SEARCH DID NOT CONVERGE' //	MANS4450
NAMELIST/NALPC/ NALP, DALPC, ALPC, ALPC1, ALPHAP, XMACHP,	MANS4460
1 PRESSP, TEMPP, RHOA, QS, RC, ALTA, SSVA, VCL, CFP	MANS4470
IF (LINOUT .GT. 1) WRITE(6,NALPC)	MANS4480
GO TO 9000	MANS4490
C	MANS4500
C	MANS4510
530 CONTINUE	MANS4520
C ANGLE OF ATTACK CONVERGED. CONTINUE SEARCH LOGIC FOR MAX R/C	MANS4530
C SPEED	MANS4540
HDOT=VCL*SINGAM	MANS4550
IF((LINOUT.GT.0).OR.(LINOUT.LT.-1))	MANS4560
*WRITE(6,580) ALTA, VCL, HDOT, ALPC, THR, DRAG, SINGAM	MANS4570
580 FORMAT(// ' ALTA=' ,F7.0,	MANS4580
2 ' VCL =' ,F7.2,	MANS4590
3 ' HDOT=' ,F7.2,	MANS4600
4 ' ALPC=' ,F7.5,	MANS4610
5 ' THR=' ,F7.1,	MANS4620
6 ' DRAG=' ,F7.1,	MANS4630
7 ' SINGAM=' ,F7.5//	MANS4640
IF(J-2) 540,541,545	MANS4650

C		MANS4660
C	SAVE FIRST POINT ON R/C VS VCL CURVE.	MANS4670
540	CONTINUE	MANS4680
	HDDTA(1)=HDDT	MANS4690
	VCLA(1)=VCL	MANS4700
	GO TO 572	MANS4710
C		MANS4720
C	SECOND POINT ON R/C VS VCL CURVE	MANS4730
541	CONTINUE	MANS4740
	IF(HDDT- HDDTA(1)) 543,542,542	MANS4750
C		MANS4760
C	R/C INCREASED. SAVE SECOND POINT	MANS4770
542	HDDTA(2)=HDDT	MANS4780
	VCLA(2)=VCL	MANS4790
	GO TO 570	MANS4800
C		MANS4810
C	R/C DECREASED AFTER FIRST STEP. REVERSE SEARCH DIRECTION.	MANS4820
543	CONTINUE	MANS4830
	HDDTA(2)=HDDTA(1)	MANS4840
	VCLA(2)=VCLA(1)	MANS4850
	HDDTA(1)=HDDT	MANS4860
	VCLA(1)=VCL	MANS4870
	DVCL=-DVCL	MANS4880
	VCL=VCLA(2)	MANS4890
	GO TO 570	MANS4900
C		MANS4910
C	THIRD AND SUBSEQUENT POINTS ON R/C VS VCL CURVE	MANS4920
545	HDDTA(3)=HDDT	MANS4930
	VCLA(3)=VCL	MANS4940
C		MANS4950
C	IF R/C DECREASED, MAX R/C HAS BEEN BRACKETED	MANS4960
	IF(HDDTA(3) - HDDTA(2)) 650,650,550	MANS4970
550	CONTINUE	MANS4980
	HDDTA(1)=HDDTA(2)	MANS4990
	HDDTA(2)=HDDTA(3)	MANS5000
	VCLA(1)=VCLA(2)	MANS5010
	VCLA(2)=VCLA(3)	MANS5020
570	CONTINUE	MANS5030
	IF ((VCL.LT.VMAX) .AND. (VCL.GT.VMIN)) GO TO 572	MANS5040
	VCLS=VCL	MANS5050
	GO TO 680	MANS5060
572	CONTINUE	MANS5070
	VCL=VCL+DVCL	MANS5080
	VCL=AMINI(VCL, VMAX)	MANS5090
	VCL=AMAXI(VCL, VMIN)	MANS5100
C		MANS5110
C		MANS5120
600	CONTINUE	MANS5130
C	END OF DO LOOP FOR CLIMB SPEED SEARCH	MANS5140
C		MANS5150
C		MANS5160
C	NORMAL EXIT SIGNIFIES FAILURE	MANS5170
	IF (LINDT .NE. 0) WRITE (6,640) ALTA	MANS5180
640	FORMAT(// ' FAILURE IN MAINS CLIMB SCHEDULE GENERATION. CLIMB SPANS	MANS5190
	1PPEED SEARCH FAILED AT ALTITUDE=' , F10.0, ' FT.' / ' CLIMB PHASE	MANS5200

2	WILL PROCEED IF AT LEAST TWO POINTS ON CLIMB SCHEDULE HAVE BEEN	MANS5210
3	GENERATED')	MANS5220
	GO TO 665	MANS5230
C		MANS5240
650	CONTINUE	MANS5250
C	PERFORM SECOND ORDER CURVE FIT THROUGH LAST THREE POINTS ON R/C	MANS5260
C	VS SPEED CURVE	MANS5270
	A1= VCLA(2)*VCLA(3)**2 - VCLA(2)**2*VCLA(3)	MANS5280
	A2= VCLA(3)*VCLA(1)**2 - VCLA(3)**2*VCLA(1)	MANS5290
	A3= VCLA(1)*VCLA(2)**2 - VCLA(1)**2*VCLA(2)	MANS5300
	A= HDOTA(1)*A1 + HDOTA(2)*A2 + HDOTA(3)*A3	MANS5310
	C= A1+A2+A3+1.E-20	MANS5320
	P= HDOTA(2)*VCLA(3)**2 - VCLA(2)**2 *HDOTA(3)	MANS5330
1	+HDOTA(2)*VCLA(1)**2 - VCLA(3)**2 *HDOTA(1)	MANS5340
1	+HDOTA(1)*VCLA(2)**2 - VCLA(1)**2 *HDOTA(2)	MANS5350
	C1= VCLA(2)*HDOTA(3) - HDOTA(2)*VCLA(3)	MANS5360
1	+VCLA(3)*HDOTA(1) - HDOTA(3)*VCLA(1)	MANS5370
1	+VCLA(1)*HDOTA(2) - HDOTA(1)*VCLA(2)	MANS5380
C	SAVE MAX R/C AND ASSOCIATED CLIMB SPEED	MANS5390
	VCLS =-B/(2.*C1)	MANS5400
	HDOTS =(A + B*VCLS +C1*VCLS*VCLS)/D	MANS5410
	IF((LINOUT.GT.0).OR.(LINCUT.LT.-1))	MANS5420
	*WRITE(6,660) HDOTS, VCLS, A, B, C1, D	MANS5430
660	FORMAT(' MAX R/C=', F10.2, ' FT/SEC, V=', F10.2, ' FT/SEC A=',	MANS5440
	IF15.3, ' B=', F15.3, ' C=', F15.3, ' D=', F15.3)	MANS5450
C		MANS5460
C	IF R/C IS NEGATIVE, COMPUTE A MAXIMUM ALTITUDE WHICH	MANS5470
C	WILL CONSTRAIN SUBSEQUENT PHASES	MANS5480
	IF(HDOTS .GT. 0) GO TO 680	MANS5490
	ALTMAX=HCLS(I-1)	MANS5500
665	CONTINUE	MANS5510
	IF(I-1 .GE. 2) GO TO 800	MANS5520
	IF (LINOUT .NE. 0) WRITE (6,670)	MANS5530
670	FORMAT(// ' FAILURE IN MAINS CLIMB SCHEDULE GENERATION.',	MANS5540
1	' POSITIVE RATE OF CLIMB FOUND FOR ONLY ONE POINT')	MANS5550
	GO TO 9000	MANS5560
C		MANS5570
C	SAVE CLIMB MACH NO. AND ALTITUDE IN STLU ARRAY	MANS5580
680	CONTINUE	MANS5590
	STLU(I,4)=VCLS/SSVA	MANS5600
	STLU(I,3)=ALTA	MANS5610
	HCLS(I+1)=HCLS(I)+DHCL	MANS5620
C	MAKE LAST POINT THE CRUISE ALTITUDE+1000 FT.	MANS5630
	IF(I .EQ. NALTS-1) HCLS(NALTS)=ALTF+1000.	MANS5640
700	CONTINUE	MANS5650
	IF (LINOUT .NE. 0) CALL PAGE	MANS5660
	IPROP1=IPSV	MANS5670
	*****END OF DO LOOP FOR ALTITUDE SURVEY*****	MANS5680
C		MANS5690
C		MANS5700
C		MANS5710
800	CONTINUE	MANS5720
C		MANS5730
C	CONSTRAIN INPUT ALTF TO VALUE OF ALTMAX. NOTE THAT ALTMAX IS	MANS5740
C	INITIALIZED TO 1.E8 IN STDATA.	MANS5750

C	ALTF=AMIN1(ALTF,ALTMX)	MANS5760
C		MANS5770
C		MANS5780
C	START INTEGRATION OF PHASE	MANS5790
	CALL RUNGEK (KWISH)	MANS5800
	IF (KWISH .EQ. 4321) GO TO 9876	MANS5810
	RETURN	MANS5820
	END	MANS5830
	SUBROUTINE OUTPUT	OUTP0010
C	PCM=NUK.CGSM RKM/HUE 7/11/73 FIV-ERCD	OUTP0020
C	SUBROUTINE OUTPUT PRINTS TABULAR TIME HISTORY OF TRAJECTORY	OUTP0030
C	VARIABLES.	OUTP0040
C	NOUT= COUNTER FOR TOTAL NUMBER OF OUTPUT PCINTS PER TRAJ.	OUTP0050
C	NOUT=0 AT START AND AT COMPLETION OF TRAJ.	OUTP0060
C	NLines= COUNTER FOR NUMBER OF OUTPUT LINES PER PAGE.	OUTP0070
C	NLines=0 AT START OF TRAJ	OUTP0080
C	NPAGE= PAGE NUMBER	OUTP0090
C	IPRINT= FLAG TO SUPPRESS PRINTING. IPRINT=0 SUPPRESSES OUTPUT	OUTP0100
C		OUTP0110
	COMMON /QACOST/ QMAXQ, VMAXQ, DUMQA(8)	OUTP0120
	COMMON/CIBLK/CI(1000)/CBLK/C(400)	OUTP0130
	1 /OUTBLK/PAGEB(14,50)/BCDBLK/LINE1(20),LINE2(20)	OUTP0140
	EQUIVALENCE (GSTD, CI(25))	OUTP0150
C	WORKING COMMON STDATA, MAINS, DERIV, OUTPUT	OUTP0160
	EQUIVALENCE	OUTP0170
	1 (RC, C(1)), (Q, C(2)), (QS, C(3)),	OUTP0180
	2 (GRAV, C(4)), (GRAVT, C(5)), (GRAVN, C(6)),	OUTP0190
	3 (TWOG, C(7)), (THR, C(8)), (THRQ, C(9)),	OUTP0200
	4 (SSV, C(10)), (RHO, C(11)), (PRESS, C(12)),	OUTP0210
	5 (VISC, C(13)), (TEMP, C(14)), (ALPHA, C(15)),	OUTP0220
	6 (XMACH, C(16)), (CDO, C(17)), (CLAQS, C(18)),	OUTP0230
	7 (CLALF, C(19)), (CF, C(20)), (WF, C(21)),	OUTP0240
	8 (SFC, C(22)), (TT4, C(23)), (ANZ, C(24)),	OUTP0250
	9 (ANX, C(25)), (NITER, C(26)), (NBOOST, C(27)),	OUTP0260
	* (NSPHAZ, C(28)), (IPRINT, C(29)), (RSAVE, C(30)),	OUTP0270
	1 (ETA, C(31)), (TSAVE, C(32)), (XTOL, C(33)),	OUTP0280
	2 (NFERR, C(34)), (ERLIMT, C(35)), (NEQ, C(36)),	OUTP0290
	3 (IDONE, C(37)), (NDONE, C(38)), (ERLOG, C(39)),	OUTP0300
	4 (NRAD, C(40)), (JSTEP, C(41)), (TTCL, C(42)),	OUTP0310
	5 (TMAX, C(43)), (DELT, C(44)), (KSUB, C(45)),	OUTP0320
	7 (KKK, C(56)), (INDEX, C(57))	OUTP0330
	EQUIVALENCE	OUTP0340
	1 (TCUT, C(58)), (IOUT, C(59)), (NPHAZ, C(60)),	OUTP0350
	2 (SINGAM, C(73)), (COSGAM, C(74)), (DALP, C(75)),	OUTP0360
	3 (VMAS, C(76)), (GDOTRQ, C(77)), (DEGRAD, C(78)),	OUTP0370
	4 (TVAC, C(79)), (AEXIT, C(80)), (XISP, C(81)),	OUTP0380
	5 (ACCN, C(82)), (ACCT, C(83)), (XNOW, C(84)),	OUTP0390
	6 (WPR, C(85)), (WEMPTY, C(86)), (NPAGE, C(87)),	OUTP0400
	7 (NOUT, C(88)), (NLines, C(89)), (NCON, C(90)),	OUTP0410
	8 (NMAP, C(91)), (RNGI, C(92)), (NTRY, C(93)),	OUTP0420
	9 (ALTMX, C(94))	OUTP0430
C	INTEGRATION VARIABLES STDATA MAINS DERIV, OUTPUT	OUTP0440

	REAL*8 XPRIM1	OUTP0450
	COMMON/RKBLK/X(10),XDOT(10),XPRIM1(10)	OUTP0460
	EQUIVALENCE	OUTP0470
1	(TIME, X(1)), (GAMMA, X(2)), (V, X(3)),	OUTP0480
2	(ALT, X(4)), (R, X(5)), (W, X(6)),	OUTP0490
3	(VI, X(7)),	OUTP0500
4	(GDOT, XDOT(2)), (VDOT, XDOT(3)),	OUTP0510
5	(HDOT, XDOT(4)), (RDOT, XDOT(5)), (WDOT, XDOT(6)),	OUTP0520
6	(VIDOT, XDOT(7))	OUTP0530
	EQUIVALENCE (CI(45), LINDOUT)	OUTP0540
C		OUTP0550
	DIMENSION PAGEA(14),IPAGER(50)	OUTP0560
	IF (Q .GT. QMAXQ) QMAXQ = Q	OUTP0570
	IF (V .GT. VMAXQ) VMAXQ = V	OUTP0580
	IF (LINDOUT .EQ. 0) GO TO 9000	OUTP0590
	IF(IPRINT .EQ. 0) GO TO 9000	OUTP0600
	IF(NOUT .GT. 0) GO TO 40	OUTP0610
	IF(NLINES .EQ. 0) GO TO 15	OUTP0620
	IF(NLINES .EQ.50) GO TO 9000	OUTP0630
	GO TO 75	OUTP0640
C		OUTP0650
C		OUTP0660
	15 CONTINUE	OUTP0670
C	WRITE TABLE A HEADING	OUTP0680
	CALL PAGE	OUTP0690
	20 FORMAT(1H1, 1X, 20A4,27H1TV AEROSPACE CORP./CONCEPT, 13/	OUTP0700
	1 2X, 20A4,26HVHEPER PAGE , 13,1HA)	OUTP0710
	WRITE(6,30)	OUTP0720
	30 FORMAT(/4X, 'TIME', 3X, 'GAMMA', 3X, 'SPEED', 1X, 'ALTITUDE',	OUTP0730
	1 3X, 'RANGE', 2X, 'WEIGHT', 3X, 'THRUST', 6X, 'NX',	OUTP0740
	2 6X, 'NZ', 2X, 'ALPHA', 3X, 'THETA', 5X, 'LIFT',	OUTP0750
	3 5X, 'DRAG', 2X, 'MACH', 1X, 'STEPS', 1X, 'STEPS',	OUTP0760
	4 1X, 'NERR'/	OUTP0770
	* 4X, ' SEC', 3X, ' DEG', 3X, 'FT/SEC', 1X, ' FT',	OUTP0780
	1 3X, ' N MI', 2X, ' LBM', 3X, ' LBF', 6X, ' G',	OUTP0790
	2 6X, ' G', 2X, ' DEG', 3X, ' DEG', 5X, ' LBF',	OUTP0800
	3 5X, ' LBF', 2X, ' ', 1X, ' GOOD', 1X, ' RAD')	OUTP0810
	IF(NOUT .NE. 0) GO TO 9000	OUTP0820
	40 CONTINUE	OUTP0830
	NOUT=NOUT+1	OUTP0840
	NLINES=MOD(NOUT,50)	OUTP0850
	IF(NLINES .EQ. 0) NLINES=50	OUTP0860
C		OUTP0870
C	COMPUTE AND PRINT A LINE OF PAGE A DATA	OUTP0880
	DO 50 I=1,6	OUTP0890
	50 PAGEA(I) = X(I)	OUTP0900
	PAGEA(2)=PAGEA(2)*DEGRAD	OUTP0910
	PAGEA(5)=PAGEA(5)/6076.115	OUTP0920
	PAGEA(7)=THR	OUTP0930
	PAGEA(8)=(VDOT-GRAVT)/GSTD	OUTP0940
	PAGEA(9)=ANZ	OUTP0950
	PAGEA(10)=ALPHA*DEGRAD	OUTP0960
	PAGEA(11)= (ALPHA+GAMMA)*DEGRAD	OUTP0970
	PAGEA(12)= CLAQS*ALPHA	OUTP0980
	PAGEA(13)= PAGEA(12)*ALPHA + CDD*QS	OUTP0990

	PAGEA(14)=XMACH	OUTP1000
	WRITE(6,60) PAGEA, JSTEP, NBAD, NERR	OUTP1010
60	FORMAT(1X, F7.2, F8.2, F8.1, F9.1, F8.2, F8.1, F9.1, 2F8.3,	OUTP1020
1	F7.2, F8.2, 2F9.1, F6.2, 2I6, I5)	OUTP1030
C		OUTP1040
C	SAVE A LINE OF TABLE B DATA	OUTP1050
	N=N LINES	OUTP1060
	PAGER(1,N)=X(1)	OUTP1070
	PAGEB(2,N)=XDOT(2)*DEGRAD	OUTP1080
	CC 70 I=1,4	OUTP1090
	I2=I+2	OUTP1100
70	PAGER(I2,N)=XDOT(I2)	OUTP1110
	PAGER(7,N)= THRO/(QS+1.E-10)	OUTP1120
	PAGER(8,N)= THR/ (QS+1.E-10)	OUTP1130
	PAGER(9,N)= WF/(THR+1.E-10)*3600.	OUTP1140
	PAGER(10,N)=TT4	OUTP1150
	PAGER(11,N)= THR/(WF+1.E-10)	OUTP1160
	PAGER(12,N)= X(7)	OUTP1170
	IPAGER(N)=NMAP	OUTP1180
	PAGER(13,N)=Q	OUTP1190
C		OUTP1200
	IF(N LINES .LT. 50) GO TO 9000	OUTP1210
C		OUTP1220
C	WRITE TABLEB HEADING AND CONTENTS OF PAGER ARRAY	OUTP1230
75	CONTINUE	OUTP1240
	CALL PAGE	OUTP1250
80	FORMAT(1H1, 1X, 20A4, 27H1TV AEROSPACE CORP./CONCEPT, 13/	OUTP1260
1	2X, 2CA4, 26H1VEHPER PAGE , 13, 1H8)	OUTP1270
C		OUTP1280
	WRITE(6,90)	OUTP1290
50	FORMAT(/4X, 'TIME', 3X, 'G-DOT', 4X, 'V-DOT', 4X, 'H-DOT',	OUTP1300
2	3X, 'R-DOT', 3X, 'W-DOT', 3X, 'CFNREQ', 6X, 'CFN',	OUTP1310
3	8X, 'SFC', 4X, 'TT4', 5X, 'ISP', 1X, 'V-IDEAL', ' NMAP',	OUTP1320
*	1X, 'DYN PRESS'/	OUTP1330
1	5X, 'SEC', 1X, 'DEG/SEC', 3X, 'FT/SEC', 3X, 'FT/SEC',	OUTP1340
2	2X, 'FT/SEC', 1X, 'LBM/SEC', 18X,	OUTP1350
3	1X, 'LBM/HR/LBF', 2X, 'DEG R', 5X, 'SEC', 2X, 'FT/SEC' ,	OUTP1360
*	8X, 'LBS/FT2')	OUTP1370
C		OUTP1380
	WRITE(6,100) ((PAGEB(I,J), I=1,12), IPAGEB(J), PAGER(13,J),	OUTP1390
	* J=1, N LINES)	OUTP1400
100	FORMAT(1X, F7.2, F8.3, 2F9.1, F8.1, F8.1, 2F9.5, F11.4,	OUTP1410
1	F7.1, F8.1, F8.1, I5, F10.2)	OUTP1420
C		OUTP1430
	NPAGE=NPAGE+1	OUTP1440
	IF(N LINES .EQ.50) GO TO 15	OUTP1450
9000	RETURN	OUTP1460
	END	OUTP1470
C		
	SUBROUTINE PROP11	PRP10010
C	MODES -1 MIN THRUST	PRP10020
C	MODES 0 CFN REQUIRED	PRP10030
C	MODES +1 MAX THRUST	PRP10040

	COMMON /EPRT/ BOMB(4),MUM,IARI(2)	PRP10050
	COMMON /EXCLUD/ PT2, TT2, PTO, CDA, AQAC, PT2PO	PRP10060
	COMMON /PRINTR/ I2(2),IVP,I4(4)	PRP10070
	COMMON /FAILUR/ KFAIL	PRP10080
	COMMON /RJBLOK/ RJ(50)	PRP10090
	EQUIVALENCE	PRP10100
	1(PJ(1),CNM),(RJ(2),ANC),(RJ(3),ANN),(RJ(4),AL),	PRP10110
	2 (RJ(6), CDB), (RJ(7), C1),	PRP10120
	3(PJ(9),PT4Y),(RJ(10),GAM),(RJ(11),A6MAX),(RJ(12),ACMAX),	PRP10130
	4 (RJ(13), A6MIN), (RJ(14), XMOMR),	PRP10140
	5(RJ(17),CDC),(RJ(18),PCMGN), (RJ(20),ALFOLD),	PRP10150
	6(RJ(21),A2A3),(RJ(22),FARLR),(RJ(23),IID),(RJ(24),RPAR),	PRP10160
	7 (RJ(26),TT4),(RJ(27),FAR),(RJ(28),PM),	PRP10170
	8 (RJ(29), WF), (RJ(30), ANC4), (RJ(31), PT2PCC),	PRP10180
	9(RJ(33),TO),(RJ(34),PO),(RJ(35),KDIA),(RJ(36),PT4I),	PRP10190
	X (RJ(37),PT4I),(RJ(38),PT42),(RJ(39),PT43),	PRP10200
	1(PJ(40),AM6),(PJ(41),AM4),(RJ(42),AM2),(RJ(43),GAM2),	PRP10210
	2 (RJ(44), GAM4), (RJ(45), P6), (RJ(47), AR2),	PRP10220
	3(RJ(48),AR4),(PJ(49),PT4),(RJ(50),WAA3)	PRP10230
C	COMMON BLOCK FOR ALTITUDE,TITLE,ID AND FUEL DECKS	PRP10240
	COMMON /ALTD/	PRP10250
	1K1,ALT(24),SDTEMP(24),PRESS(24),ID(8)	PRP10260
	COMMON /FUFLXX/	PRP10270
	2K2,KK(15),TT2TAB(15),TFAR1(15,15),TTRS1(15,15),TTRS2(15,15),	PRP10280
	X TTRS3(15,15),	PRP10290
	3K3,KI(15),JGAMM,TT4TA(15),TFAR2(15,15),TGAM(15,15),FG(15,15),	PRP10300
	XFG(15,15),	PRP10310
	4K4,KN(15),JR, TT4TB(15),TFAR3(15,15),RTAB(15,15),ER(15,15),	PRP10320
	XFR(15,15),	PRP10330
	5NPI,AAM(24),ANC1(24),FARL(24)	PRP10340
C	COMMON BLOCK FOR INLET PERFORMANCE MAP	PRP10350
	COMMON/ INLETX/	PRP10360
	6K8,KPTC(15),ALPHV(15),AAMACH(15,15),AQACC(15,15),PT3PTC(15,15),	PRP10370
	1AADD(15,15)	PRP10380
	COMMON/RJDAT/CFN1,CFN2,A5A3,A6A3,ACA3,SFC,B11,B12,B13	PRP10390
	COMMON/TRAJX/ CFNET,CFNRQ,AMACH,ALF1,MODES,IND,FARMAX,TT4MAX,FSLR	PRP10400
	1,ICODE	PRP10410
	COMMON/EXTERN/ AR(20)	PRP10420
	EQUIVALENCE (AR(3),D3),(AR(12),A3)	PRP10430
C	OPT 1 PC MARGIN MODE = 1	PRP10440
C	OPT 2 TT4 MAX KODE2 = 1	PRP10450
C	OPT 3 FAR MAX MODE = 2	PRP10460
C	OPT 4 CFN	PRP10470
C	TABLE 2 TEMP RISE	PRP10480
C	TABLE 3 GAMMA	PRP10490
C	TABLE 4 R	PRP10500
C	TABLE 5 BURNER SEVENTY TABLE (TEMP RISE EFF, LEAN BLOW CUT)	PRP10510
C	TABLE 6 INLET MAP (PT2PTO,AQAC,CDA)	PRP10520
	COMMON /CODEXX/II(16)	PRP10530
	EQUIVALENCE (II(1),KIND)	PRP10540
	COMMON /CBLK/ CLATR(400)	PRP10550
	EQUIVALENCE (CLATR(60), NPHAZ)	PRP10560
	LOGICAL OPT(3)	PRP10570
	LOGICAL L1,L2,L3,L4	PRP10580
	DIMENSION NUMBER(6), JVER(7)	PRP10590

DATA NUMBER/'1','2','3OR4','3OR4','5','6'/	PRP10600
DATA JVER/'DTRQ','PT4','AM2','AM2*','AOAC','PMAR','CFRQ'/	PRP10610
NAMelist /STOP/ ALF1,AMACH,8PAR,PO, FAR,TT2, TT4,	PRP10620
1WAA3,TTQ,PTQ,AOAC,PT2PO,DTRISE,ANC,MODES, DTREQ,PT4N,PPR	PRP10630
2T4!,PT2MAR,PT2POC,AM2,AM2NEW,CFNET,CFNRQ,WF,WA,J1,J2,J3,J4,J5,J6,	PRP10640
3 FARLB,PT2POA	PRP10650
4 ,AM4,AM6,GAM2,GAM4,CDA,AR2,AR4,ACA3,A5A3,P6PT6,GAM	PRP10660
5 ,CFHI,CFLO,WFHI,WFLD,L1,L2,L3,L4	PRP10670
GAMF(Q,R)=(1.+(Q-1.)/2.*R*R)	PRP10680
WFHI = 0.0	PRP10690
WFLD = 0.0	PRP10700
NDUT=IVP	PRP10710
IND = 0	PRP10720
CALL ISEN (TO,PO,AMACH,TT2,PTQ)	PRP10730
IF(KFAIL .GT. 0) RETURN	PRP10740
75 TTQ=TT2	PRP10750
C OBTAIN PRESS RECOVERY,AOAC AND ADDITIVE DRAG	PRP10760
CALL TLU2(ALF1,ALPHV,K8,AMACH,AAMACH,KPTC,AOACC,AOAC,IND)	PRP10770
IF(IND.NE.0) GO TO 415	PRP10780
CALL TLU22(PT3PTQ,PT2POA)	PRP10790
CALL TLU22(ADDD,CDA)	PRP10800
PT2MAR =(1.-PCMGN/100.)*PT2POA	PRP10810
PT2 = PTQ*PT2MAR	PRP10820
L4=.FALSE.	PRP10830
IF(ICODE.NE.0) GO TO 10	PRP10840
A3=.7854*Q3**2/144.	PRP10850
A2A3 = 1.	PRP10860
L2=.FALSE.	PRP10870
L3=.FALSE.	PRP10880
OPT(2)=.FALSE.	PRP10890
OPT(3)=.FALSE.	PRP10900
IF(TT4MAX.GT.0.) OPT(2) = .TRUE.	PRP10910
IF(FARMAX.GT.0.) OPT(3)=.TRUE.	PRP10920
A5A6=A5A3/A6A3	PRP10930
A6A5=1./A5A6	PRP10940
ICODE = 1	PRP10950
10 L2= OPT(2)	PRP10960
L3=OPT(3)	PRP10970
L1=.TRUE.	PRP10980
IXX = 0	PRP10990
PART=GAM/2.*PO*AMACH**2*A3	PRP11000
AOA3=AOAC*ACA3	PRP11010
WAA3=SQR(T(GAM)*.7765056*PO*AMACH/SQR(T(TO))*AOAC*ACA3	PRP11020
WA=WAA3*A3	PRP11030
CA=CDA*PART*ACA3	PRP11040
RDR=XMODMR*WA*AL/32.174*AMACH*49.04*SQR(T(TO)	PRP11050
DR=2.*AOA3*PART-RDR	PRP11060
C	PRP11070
AOA2=(AOAC*ACA3)/A2A3	PRP11080
BPAR=WAA3*(1.-AL)/A5A3*(TTQ/1000.1)**2	PRP11090
CALL TLU1(BPAR,AAM,NB1,ANC1,ANC,IND)	PRP11100
IF(IND.NE.0) GO TO 410	PRP11110
CALL TLU11(FARL,FARLB)	PRP11120
IF(FARLB.LE.0.) FARLB = 0.005	PRP11130
WF = .025*3600.*A3*WAA3*(1.-AL)	PRP11140

IF(MODES) 15,17,16	PRP11150
15 FAR= FARL9*FSLB0	PRP11160
WF = FAR*WA*3600.0*(1.-AL)	PRP11170
L2 = .FALSE.	PRP11180
GO TO 225	PRP11190
17 L4 =.TRUE.	PRP11200
IF(CFNRQ .LE. 0.) GO TO 456	PRP11210
16 IF (OPT(3))	PRP11220
WF =FARMAX*3600.*A3*(1-AL)*WAA3	PRP11230
IF(OPT(2))	PRP11240
1DTREQ=(TT4MAX-TT2)/ANC	PRP11250
225 PT2PC = PT2MAR	PRP11260
230 PT2PDC=PT2POA	PRP11270
C	PRP11280
C	PRP11290
J5=0	PRP11300
J6=0	PRP11310
235 PT4I=.91*PT2PD*PD*(TTO/TO)**(GAM/(GAM-1.))	PRP11320
FAR=WF/(WA*3600.*(1.-AL))	PRP11330
240 J1=0	PRP11340
J2=0	PRP11350
245 CALL DTRGET (FAR,TT2,DTRISE,IND)	PRP11360
IF (IND.NE.0) GO TO 395	PRP11370
TT4=TT2+ANC*DTRISE	PRP11380
IF(.NOT.L3 .AND. L2) GO TO 250	PRP11390
GO TO 260	PRP11400
250 IF (ABS(DTRISE-DTREQ).LT..5) GO TO 259	PRP11410
IF (J1.GT.50) GO TO 345	PRP11420
J1=J1+1	PRP11430
FAR=FAR*DTREQ/DTRISE	PRP11440
IF (OPT(3).AND.FAR.GT.FARMAX) FAR=FARMAX	PRP11450
GO TO 245	PRP11460
259 WF = FAR * 3600. * A3 * (1.-AL) * WAA3	PRP11470
260 CALL RGAMER (IID,0.0, TT2,GAM2,IND,AR2)	PRP11480
IF (IND.NE.0) GO TO 40C	PRP11490
CALL RGAMER (IID,FAR, TT4,GAM4,IND,AR4)	PRP11500
IF (IND.NE.0) GO TO 40C	PRP11510
C	PRP11520
PT4N=((1.-AL)*(1.+FAR)*WAA3*SQRT(TT4))/(A5A3*CNM*SCFT((32.2*GAM4/	PRP11530
1R4)*((2./(GAM4+1.))**((GAM4+1.)/(GAM4-1.))))	PRP11540
IF (ABS(PT4I-PT4N).LT.2.) GO TO 265	PRP11550
PT4I=PT4N	PRP11560
IF (J2.EQ.50) GO TO 350	PRP11570
J2=J2+1	PRP11580
GO TO 245	PRP11590
C	PRP11600
265 CAR=CNM*A5A3	PRP11610
ER=1./CAR	PRP11620
K=-1	PRP11630
CALL MACHNO (BR,GAM4,AM4,K,IND)	PRP11640
IF (IND.NE.0) GO TO 385	PRP11650
AM2=0.1	PRP11660
STO1=0.	PRP11670
STO2=0.	PRP11680
PPI=AM4*SQRT(GAMF(GAM4,AM4))	PRP11690

FR2=1.-CDB/2.	PRP11700
BR3=1.+GAM4*AM4*AM4	PRP11710
BP4=(GAM2-1.)/2.	PRP11720
BR5=(1.+FAR)*(1.-AL)*SQRT((GAM2*AR4*TT4)/(GAM4*AR2*TT2))	PRP11730
J3=0	PRP11740
270 CONTINUE	PRP11750
G22=AM2*AM2	PRP11760
AM2NEW=BR1*(1.+GAM2*G22*BB2)/(BR3*SQRT(1.+BB4*G22))/BB5	PRP11770
IF (ABS(AM2NEW-AM2)-.0001) 280,280,275	PRP11780
275 IF (J3.CT.50) GO TO 355	PRP11790
J3=J3+1	PRP11800
AA=(AM2NEW-STO1)/(AM2-STO2)	PRP11810
IF (AA.EQ.1.) GO TO 360	PRP11820
Q=AA/(AA-1.)	PRP11830
IF (Q.GE.1.) Q=.99	PRP11840
IF (Q.LE.-1.) Q=-.99	PRP11850
STO1=AM2NEW	PRP11860
STO2=AM2	PRP11870
AM2=Q*STO2+(1.-Q)*STO1	PRP11880
GO TO 270	PRP11890
C	PRP11900
C	PRP11910
280 PT2POC=PO/PTO*AMACH/AM2*SQRT(GAM*TT2/GAM2/TO)*(1.+(GAM2-1.)/2.*AM2	PRP11920
1**2)**((GAM2+1.)/2./(GAM2-1.))*AOA2	PRP11930
K=1	PRP11940
CALL MACHNO (A6A5,GAM4,AM6,K,IND)	PRP11950
IF (IND.NE.0) GO TO 385	PRP11960
IF (MODES .LT. 0) GO TO 325	PRP11970
IF(L3) GO TO 285	PRP11980
IF(L2) GO TO 290	PRP11990
IF(L1) GO TO 300	PRP12000
325 PT2PO = PT2POC	PRP12010
P6PT6=GAM6(GAM4,AM6)**(-GAM4/(GAM4-1.))	PRP12020
CFINT=(A6A3/(.7*AMACH**2))*(PT4N/PO*ANN*P6PT6*(1.+GAM4*AM6**2)-1.)	PRP12030
1-2.*AOA2*ACA3	PRP12040
FC=(CFINT+2.*AOA3)*PART	PRP12050
FN=FG-DR-DA	PRP12060
CFNET=FN/PART	PRP12070
IF(MODES.NE.0) GO TO 326	PRP12080
315 IF (ABS(CFNET-CFNRQ) .LT. .001) GO TO 326	PRP12090
IF(IXX.EQ.0) GO TO 327	PRP12100
316 IF(CFNET .LE. 0.005) GO TO 312	PRP12110
IF(CFNET .LT. CFNRQ) GO TO 317	PRP12120
WFHI = WF	PRP12130
CFHI = CFNET	PRP12140
IF (WFLO .GT. 0.0) GO TO 318	PRP12150
319 WF = WF*(CFNRQ/CFNET)**.84	PRP12160
320 IF(J6 .GT. 50) GO TO 375	PRP12170
IF(J6 .GT. 40) WRITE(6,STOP)	PRP12180
J6=J6+1	PRP12190
GO TO 417	PRP12200
317 CFLO = CFNET	PRP12210
WFLO = WF	PRP12220
IF(WFHI .LE. 0.0) GO TO 319	PRP12230
318 WF = WFLO + (CFNRQ-CFLO)/(CFHI-CFLO)*(WFHI -WFLO)	PRP12240

GO TO 320	PRP12250
326 SFC=WF/FN	PRP12260
G22=GAMF(GAM4,AM4)	PRP12270
T4=TT4/G22	PRP12280
PS2=(GAMF(GAM2,AM2))*(GAM2/(1.-GAM2))*PTO*PT2POC	PRP12290
IF(MODES .EQ. -2) MODES = 0	PRP12300
RETURN	PRP12310
327 IF(CFNET.LT.CFNRO) GO TO 326	PRP12320
L1 = .FALSE.	PRP12330
L2 = .FALSE.	PRP12340
L3 = .FALSE.	PRP12350
IXX = 1	PRP12360
GO TO 316	PRP12370
285 IF(L2) GO TO 301	PRP12380
259 IF(.NOT.L1) GO TO 325	PRP12390
IF(PT2POC .LT. PT2MAR) GO TO 305	PRP12400
L3 = .FALSE.	PRP12410
GO TO 300	PRP12420
301 IF(TT4 .GT. TT4MAX) GO TO 302	PRP12430
L2 = .FALSE.	PRP12440
GO TO 299	PRP12450
302 L3 = .FALSE.	PRP12460
GO TO 250	PRP12470
305 L1 = .FALSE.	PRP12480
GO TO 325	PRP12490
250 IF(.NOT.L1) GO TO 325	PRP12500
IF(PT2POC .LT. PT2MAR) GO TO 305	PRP12510
L2 = .FALSE.	PRP12520
GO TO 300	PRP12530
300 IF (ABS(1.-PT2POC/PT2MAR).LE..001) GO TO 325	PRP12540
IF(J5.GT.50) GO TO 370	PRP12550
J5=J5+1	PRP12560
IF(L4) GO TO 310	PRP12570
311 WF=WF*((PT2MAR/PT2POC)**2*TT4-TT2)/(TT4-TT2)	PRP12580
417 IF(WF.LE.0.) GO TO 312	PRP12590
FAR=WF/(WAA3*A3*3600.*(1.-AL))	PRP12600
IF(OPT(3) .AND. FAR .GT. FARMAX) FAR = FARMAX	PRP12610
313 WF = FAR*3600.*A3*(1.-AL)*WAA3	PRP12620
GO TO 240	PRP12630
312 IF(FAR .LE. FARLB) GO TO 451	PRP12640
FAR= FARLB	PRP12650
GO TO 313	PRP12660
310 P6PT6=GAMF(GAM4,AM6)**(-GAM4/(GAM4-1.))	PRP12670
CFINT=(A643/(.7*AMACH**2))*(PT4N/PO*ANN*P6PT6*(1.+GAM4*AM6**2)-1.)	PRP12680
1-2.*AOAC*ACA3	PRP12690
FC=(CFINT+2.*AOA3)*PART	PRP12700
FN=HG-DR-DA	PRP12710
CFNET=FN/PART	PRP12720
CFN=CFNET	PRP12730
IF(CFN.LT. CFNRQ .OR. PT2POA.GT. PT2POC) GO TO 311	PRP12740
L1 = .FALSE.	PRP12750
GO TO 315	PRP12760
345 IND=1	PRP12770
GO TO 380	PRP12780
350 IND=2	PRP12790

GO TO 380	PRP12800
355 IND=3	PRP12810
GO TO 380	PRP12820
360 IND=4	PRP12830
IF (IVP .NE. 0) WRITE (6,520)	PRP12840
GO TO 505	PRP12850
370 IND=6	PRP12860
GO TO 380	PRP12870
375 IND=7	PRP12880
380 IF (IVP .NE. 0) WRITE (6,525) JVER(IND)	PRP12890
GO TO 505	PRP12900
385 IND=8	PRP12910
IF (IVP .NE. 0) WRITE (6,530)	PRP12920
GO TO 505	PRP12930
355 IDEN=NUMBER(2)	PRP12940
GO TO 435	PRP12950
400 IDEN=NUMBER(3)	PRP12960
GO TO 435	PRP12970
410 IDEN=NUMBER(5)	PRP12980
GO TO 435	PRP12990
415 IDEN=NUMBER(6)	PRP13000
435 IF (IVP .NE. 0) WRITE (6,540) IDEN	PRP13010
IF (IVP .NE. 0) WRITE (6,545) BOMB, IARI(MUM)	PRP13020
IF (IND.EQ.10) GO TO 440	PRP13030
IF (IVP .EQ. 0) RETURN	PRP13040
WRITE (6,550)	PRP13050
505 IF(NOUT.LE. 1) RETURN	PRP13060
WRITE (6, STOP)	PRP13070
RETURN	PRP13080
440 IF (IVP .NE. 0) WRITE (6,555)	PRP13090
GO TO 505	PRP13100
451 IF(MODES .EQ. 0) GO TO 456	PRP13110
IND = 1	PRP13120
IF (IVP .NE. 0) WRITE (6,452)	PRP13130
452 FORMAT(49H LEAN BLOW OUT PRESSURE RECOVERY EXCEEDS CRITICAL)	PRP13140
GO TO 505	PRP13150
456 MODES = -2	PRP13160
GO TO 15	PRP13170
520 FORMAT (' IMPROPER SLOPE IN ITERATION TO FIND AM2 '	PRP13180
525 FORMAT (' FAILURE TO CONVERGE IN PROPI IN THE LOOP FOR ',A4/)	PRP13190
530 FORMAT (' OF FAILURE IN MACHNO WHEN CALLED BY PROPI '	PRP13200
540 FORMAT (' OAN OUT OF TABLE CONDITION EXISTS IN TABLE ',A4,' IN PROPR	PRP13210
11 ' /)	PRP13220
545 FORMAT (' 1ST IND VARIABLE= ',E12.5,' 2ND IND VARIABLE= ',E12.5,' SPP	PRP13230
IURTABLE = ',F10.3,' SUBTABLE SIZE = ',F10.3/' THE VARIABLE OUT OF RAP	PRP13240
2NGE IS THE ',A4,' INDEPENDENT VARIABLE' /)	PRP13250
550 FORMAT (' THE INDEPENDENT VARIABLE IS LARGER THAN THE LARGEST TABL	PRP13260
IE VALUE' /)	PRP13270
555 FORMAT (' THE INDEPENDENT VARIABLE IS SMALLER THAN THE SMALLEST TAP	PRP13280
BLE VALUE' /)	PRP13290
END	PRP13300

SUBROUTINE RUNGEK (KWISH)

RUNK0010

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C      SUBROUTINE RUNGE K PERFORMS THE FOLLOWING FUNCTIONS--
C      (1) NUMERICALLY INTEGRATES ALL THE VARIABLES OF INTEGRATION
C      SIMULTANEOUSLY USING FOURTH ORDER RUNGE-KUTTA FORMULAE
C      (2) SIZES THE INTEGRATION TIME STEP TO ROUND THE INTEGRATION
C      TRUNCATION ERROR OR TO STOP THE INTEGRATION AT PRINT
C      TIMES AND PHASE TERMINATION TIME.
C      (3) CONTROLS NEWTON-RAPHSON ITERATION TO STOP THE PHASE ON
C      USER-SUPPLIED VALUE OF A TERMINATION PARAMETER, E.G.,
C      ALTITUDE, MACH, PROPELLANT WEIGHT, ETC.
C      (4) CALLS OUTPLT SUBROUTINE AT PRINT TIMES AND PHASE-END TIMES
C      (5) STOPS THE INTEGRATION IF ALTITUDE GOES NEGATIVE OR IF
C      TOO MUCH OF THE VEHICLE MASS IS CONSUMED AS PROPELLANT
C
C      REAL*8 XPRIM1, XPRIM
C      COMMON /FAILUR/ KFAIL
C      COMMON /CBLK/ C(400) /CIBLK/ CI(1000) /PIBLK/ PI(70) /IPBLK/ IP(10)
C      1 /RKBLK/ X(10), XDOT(10), XPRIM1(10)
C      EQUIVALENCE (T, X(1))
C      EQUIVALENCE
C      1 (XTOL, C( 33)), (NERR, C( 34)), (TSAVE, C( 32)),
C      2 (NEQ, C( 36)), (IDONE, C( 37)), (ERLIMT, C( 35)),
C      3 (ERLOG, C( 39)), (NBAD, C( 40)), (NDONE, C( 38)),
C      4 (TTOL, C( 42)), (TMAX, C( 43)), (JSTEP, C( 41)),
C      5 (KSUB, C( 45)), (RATIO, C( 46)), (DELT, C( 44)),
C      6 (AW(1), C( 51)), (AK(1), C( 47)),
C      7 (INDEX, C( 57)), (TOUT, C( 58)), (KKK, C( 56)),
C      8 (WEMPTY, C( 86)), (IOUT, C( 59)),
C      EQUIVALENCE
C      1 (MXSTEP, CI( 9)), (DSTART, CI( 10)), (IEREF, CI( 12)),
C      2 (ERRFAC, CI( 13)), (JPRINT, CI( 22)), (DMIN, CI( 11)),
C      3 (IPROP1, CI(38))
C      EQUIVALENCE
C      1 (XSTAR, PI( 6)), (SLOPE, PI( 7)), (DPRINT, PI( 10)),
C      2 (ALTF, PI( 2))
C      EQUIVALENCE (ITERM, IP( 1)), (IPTYPE, IP( 3))
C      DIMENSION AK(4), AW(4), XPRIM(10,2), XINC(10), XDCTPM(10,2),
C      1 OLDINC(10), XK(10)
C
C      DIMENSION XNORM(7)
C      DATA XNORM/1000., 1.0, 5000., 1.E5, 1.E6, 1000., 1000./
C      KWISH = 0
C      KKK = 0
C      RATIO = 0.00
C      NIX = -1
C      N1 = 1
C      N2 = 2
C
C      GET EXACT RAMJET PERFORMANCE AT PHASE START. CALL TC
C      DERIV INITIALIZES ANGLE OF ATTACK (ALPHA) AND THRUST (THR).
C      NAMELIST /NRK/ IPTYPE, IPROP1, C
C      IF( IPTYPE .NE. 4 .OR. IPROP1 .GT. 0 ) GO TO 99
C      DO 10 I=1,10
C      10 X(I)=XPRIM1(I)
C      IPROP1=1
C      CALL DERIV
C      IF(KFAIL.GT.0) RETURN

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	IPROP1=C	RUNK0570
C		RUNK0580
C	INITIALIZE LINEARIZED RAMJET	RUNK0590
	CALL TPROP	RUNK0600
	IF(KFAIL.GT.0) RETURN	RUNK0610
59	CONTINUE	RUNK0620
	DO 98 J=1,NEQ	RUNK0630
98	XPRIM(J,N1) = XPRIM1(J)	RUNK0640
101	DO 110 J = 1,NEQ	RUNK0650
110	X(J) = XPRIM(J,N1)	RUNK0660
	H2 = DELT	RUNK0670
	M1 = 1	RUNK0680
	M2 = 2	RUNK0690
	DELT = DELT/2.00	RUNK0700
	KSUB = 1	RUNK0710
	CALL DERIV	RUNK0720
	IF(KFAIL.GT.0) RETURN	RUNK0730
C		RUNK0740
112	IF (NDONE) 120,120,114	RUNK0750
114	CALL OUTPUT	RUNK0760
	NDONE = 0	RUNK0770
	IF(IDONE.LE.0) GO TO 120	RUNK0780
	OLDX = C(IDONE)	RUNK0790
	XMIS = XSTAR - OLDX	RUNK0800
120	ASSIGN 300 TO NSTART	RUNK0810
201	DO 202 J = 1,NEQ	RUNK0820
	XDOTPM(J,M1) = XDOT(J)	RUNK0830
202	XINC (J) = 0.00	RUNK0840
C		RUNK0850
206	KSUB = 2	RUNK0860
	ASSIGN 212 TO N	RUNK0870
207	DO 208 J = 1,NEQ	RUNK0880
	XK(J) = XDOT(J) * DELT	RUNK0890
	XINC(J) = XINC(J) + AW(KSUB-1) * XK(J)	RUNK0900
208	X(J) = XPRIM(J,N1) + AK(KSUB) * XK(J)	RUNK0910
210	CALL DERIV	RUNK0920
	IF(KFAIL.GT.0) RETURN	RUNK0930
211	GO TO N, (212,213,214,225)	RUNK0940
212	KSUB = 3	RUNK0950
	ASSIGN 213 TO N	RUNK0960
	GO TO 207	RUNK0970
213	KSUB = 4	RUNK0980
	ASSIGN 214 TO N	RUNK0990
	GO TO 207	RUNK1000
214	DO 220 J = 1,NEQ	RUNK1010
	XINC(J) = XINC(J) + AW(4) * XDOT(J) * DELT	RUNK1020
	XPRIM(J,N2) = XPRIM(J,N1) + XINC(J)	RUNK1030
220	X(J) = XPRIM(J,N2)	RUNK1040
C		RUNK1050
	ASSIGN 225 TO N	RUNK1060
	KSUB = 1	RUNK1070
	GO TO 210	RUNK1080
C		RUNK1090
225	GO TO NSTART, (320,310,300)	RUNK1100
C		RUNK1110

300	ASSIGN 310 TO NSTART	RUNK1120
	NO = N1	RUNK1130
	N1 = N2	RUNK1140
	DO 303 J = 1,NEQ	RUNK1150
	OLDINC(J) = XINC(J)	RUNK1160
	XINC(J) = 0.00	RUNK1170
303	XDOTPM(J,M2) = XDOT(J)	RUNK1180
	GO TO 206	RUNK1190
C		RUNK1200
310	DO 314 J = 1,NEQ	RUNK1210
314	XINC(J) = (XINC(J) + OLDINC(J))*3.00 - (XDOTPM(J,M1) + XDOTPM(J,M2)*4.00 + XDOT(J))*DELT	RUNK1220
	ASSIGN 315 TO KERR	RUNK1230
	N1 = NO	RUNK1240
	GO TO 340	RUNK1250
315	IF(E2 .GT. ERLIMT .AND. INDEX .EQ. 0) GO TO 500	RUNK1260
316	ASSIGN 320 TO NSTART	RUNK1270
	ASSIGN 206 TO IREGIN	RUNK1280
	A1 = A2	RUNK1290
	GO TO 404	RUNK1300
C		RUNK1310
320	RATIO = DELT / OLDEL	RUNK1320
	HFACT = DELT/(1.00 + RATIO)	RUNK1330
	ACDEF1 = -RATIO * RATIO * HFACT	RUNK1340
	ACDEF2 = RATIO*(DELT + 3.00*OLDEL)	RUNK1350
	ACDEF3 = DELT + DELT + HFACT	RUNK1360
	DO 330 J = 1,NEQ	RUNK1370
330	XINC(J) = ACDEF1*XDOTPM(J,M1) + ACDEF2*XDOTPM(J,M2) - 6.00*XINC(J)	RUNK1380
	1(J) + ACDEF3*XDOT(J)	RUNK1390
C		RUNK1400
	ASSIGN 400 TO KERR	RUNK1410
C		RUNK1420
C	PROCESS ERRORS IN THE INCREMENTS AND SELECT THE MAXIMUM ONE (E2).	RUNK1430
340	E2 = 0.00	RUNK1440
C		RUNK1450
C	SELECT THE MAXIMUM ERROR.	RUNK1460
	DO 360 J = 1,NEQ	RUNK1470
	XINN = ABS(XINC(J))/XNORM(J)	RUNK1480
	IF(XINN - E2) 360,360,358	RUNK1490
358	KERR = J	RUNK1500
	E2 = XINN	RUNK1510
360	CONTINUE	RUNK1520
	IF(E2.LT.1.E-10) E2 = 1.E-10	RUNK1530
	A1 = A2	RUNK1540
	IF(DELT.LT.0.0) CALL ERRORT	RUNK1550
	IF(DELT.LT.0.0) RETURN	RUNK1560
	A2 = ALOG(E2) - 5.00*ALOG(DELT)	RUNK1570
	GO TO KERR, (400, 315)	RUNK1580
C		RUNK1590
400	IF (E2 - ERLIMT) 402,402,510	RUNK1600
402	H2 = DELT	RUNK1610
404	OLDEL = DELT	RUNK1620
C		RUNK1630
C	CONTROL COMES HERE WHEN A SUCCESSFUL RUNGE KUTTA INTERVAL IS COMPLETED	RUNK1640
	IF (ITERM) 410,420,410	RUNK1650
		RUNK1660

C			RUNK1670
C	WHEN INDEX EXCEEDS ZERO AN ITERATION FOR DEPENDENT VARIABLE STOP		RUNK1680
410	CONTINUE		RUNK1690
	IF (INDEX)	413,411,413	RUNK1700
411	OLDMIS = XMIS		RUNK1710
	H2SAVE = H2		RUNK1720
	XMIS = XSTAR - C(IDONE)		RUNK1730
	IF (OLDMIS * XMIS)	412,413,418	RUNK1740
412	IF (SLOPE * XMIS)	413,413,418	RUNK1750
C			RUNK1760
413	INDEX = INDEX + 1		RUNK1770
	XNOW = C(IDONE)		RUNK1780
	IF(ITERM-2) 4131,4130,4131		RUNK1790
4130	H2SAVE=ABS(H2SAVE/2.00) * SIGN(1.00, OLDMIS*(XSTAR-XNOW))		RUNK1800
	GO TO 4132		RUNK1810
4131	H2SAVE=(XSTAR-XNOW)/ (XNOW-OLDX) *H2SAVE		RUNK1820
4132	DELT = H2SAVE + H2		RUNK1830
	IF(DELT) 4133,4133,4135		RUNK1840
4133	WRITE (6,4134)		RUNK1850
4134	FORMAT(30HNEGATIVE INTEGRATION INTERVAL)		RUNK1860
	GO TO 430		RUNK1870
4135	IF(ABS(H2SAVE) - XTOL) 700,415,415		RUNK1880
700	TMAX = T		RUNK1890
	GO TO 420		RUNK1900
415	IF (INDEX - 20)	418,416,416	RUNK1910
416	WRITE (6,417)		RUNK1920
417	FORMAT(54HITERATION TO STOP ON A DEPENDENT VARIABLE UNCONVERGED)		RUNK1930
	GO TO 430		RUNK1940
418	CLOX = C(IDONE)		RUNK1950
	IF (INDEX)	420,420,101	RUNK1960
C			RUNK1970
420	JSTEP = JSTEP + 1		RUNK1980
423	IF (ABS (TMAX - T) - TTOL) 424, 424, 427		RUNK1990
424	DO 425 J = 1,NEQ		RUNK2000
425	XPRIM1(J) = XPRIM(J,N2)		RUNK2010
426	CALL OUTPUT		RUNK2020
	KWISH = 4021		RUNK2030
	RETURN		RUNK2040
427	IF (JSTEP+NBAD-MXSTEP) 431,428,428		RUNK2050
428	WRITE (6,429)		RUNK2060
429	FORMAT(17HOMXSTEP EXCEEDED.)		RUNK2070
430	CALL ERRORT		RUNK2080
	IF(KFAIL.GT.0) RETURN		RUNK2090
C			RUNK2100
431	IF (H2 - DMIN)	4312,4318,4318	RUNK2110
4312	KKK = KKK + 1		RUNK2120
	IF (KKK - 10)	4319,4314,4314	RUNK2130
4314	WRITE (6,4316) DMIN		RUNK2140
4316	FORMAT(36H10 CONSECUTIVE INTERVALS LESS THANF6.4,6H SECS.)		RUNK2150
	GO TO 430		RUNK2160
4318	KKK = 0		RUNK2170
C			RUNK2180
C			RUNK2190
4319	CONTINUE		RUNK2200
C	NEGATIVE ALTITUDE CHECK		RUNK2210

IF(X(4)+100. .GT. 0) GO TO 4322	RIJNK2220
WRITE(6,4320) X(4)	RIJNK2230
4320 FORMAT(// 10# ALTITUDE= F8.2)	RIJNK2240
GO TO 430	RIJNK2250
4322 CONTINUE	RIJNK2260
C WEIGHT CHECK	RIJNK2270
IF(X(6)/WEMPTY .GT. 0.10) GO TO 4324	RIJNK2280
WRITE(6,4323)	RIJNK2290
4323 FORMAT(// 86# TEST IN RUNGE K FOUND THAT VEHICLE WEIGHT IS LESS	RIJNK2300
1 THAN 10 PERCENT OF EMPTY WEIGHT)	RIJNK2310
GO TO 430	RIJNK2320
4324 CONTINUE	RIJNK2330
A3= (A2-A1)*RATIO+A2	RIJNK2340
DELT = AMIN1 (EXP ((ERLCG - A3)/5.00), 4.00*H2)	RIJNK2350
IF(XDOT(4) .LT. 0.) DELT=AMIN1(DELT, (X(4)+100.)/(-XDOT(4))*2.	RIJNK2360
*))	RIJNK2370
IF(ITERM .EQ. 7) DELT=AMIN1(ABS((ALTF-X(4))/XDOT(4))*0.7, DELT)	RIJNK2380
C	RIJNK2390
C	RIJNK2400
423 IF (DPRINT) 438,438,434	RIJNK2410
434 IF (ABS (TOUT - T) - TTOL) 435, 435, 436	RIJNK2420
435 CALL OUTPUT	RIJNK2430
TOUT = TOUT + DPRINT	RIJNK2440
426 IF (T + DELT - TOUT) 442,442,437	RIJNK2450
427 DELT = TOUT - T	RIJNK2460
GO TO 442	RIJNK2470
438 IF (MOD(JSTEP, JPRINT)) 442,440,442	RIJNK2480
440 CALL OUTPUT	RIJNK2490
442 IF (T + DELT - TMAX) 450,444,444	RIJNK2500
444 DELT = TMAX - T	RIJNK2510
C	RIJNK2520
450 CONTINUE	RIJNK2530
C TEST FLIGHT CONDITION REGION AT THE END OF EACH STEP	RIJNK2540
IF(IPTYPE .EQ. 4 .AND. IPROP1 .EQ. 0) CALL TPROPA	RIJNK2550
IF(KFAIL.GT.0) RETURN	RIJNK2560
M0 = M1	RIJNK2570
M1 = M2	RIJNK2580
M2 = M0	RIJNK2590
N0 = N1	RIJNK2600
N1 = N2	RIJNK2610
N2 = N0	RIJNK2620
DO 460 J = 1,NEQ	RIJNK2630
XDOTPM(J,M2) = XDOT(J)	RIJNK2640
460 XINC (J) = 0.00	RIJNK2650
GO TO 206	RIJNK2660
C	RIJNK2670
500 ASSIGN 101 TO IBEGIN	RIJNK2680
GO TO 505	RIJNK2690
510 DO 520 J = 1,NEQ	RIJNK2700
XDOT(J) = XDOTPM(J,M2)	RIJNK2710
520 XINC (J) = 0.00	RIJNK2720
505 CONTINUE	RIJNK2730
NBAD = NBAD + 1	RIJNK2740
H2 = DELT	RIJNK2750
DELT = AMIN1 (EXP ((ERLCG - A2)/5.00), DELT)	RIJNK2760

A2	= A1		RUNK2770
IF (NIX - JSTEP)	540,550,540		RUNK2780
540 NIX = JSTEP			RUNK2790
CO TO IREGIN, (206,101)			RUNK2800
550 ASSIGN 101 TO IREGIN			RUNK2810
IF (NRAD+JSTEP-MXSTEP)	560,560,428		RUNK2820
560 GO TO IREGIN, (206,101)			RUNK2830
END			RUNK2840

	SUBROUTINE STDATA (IR, KR)	STDA0010
C	SUBROUTINE STDATA PERFORMS THE FOLLOWING FUNCTIONS--	STDA0020
C	(1) INITIALIZES COMMON BLOCKS ASSOCIATED WITH TRAJECTORY	STDA0030
C	COMPUTATION WITH ZEROS OR BUILT-IN NON-ZERO VALUES.	STDA0040
C	(2) READS INPUT GENERAL DATA INTO CI ARRAY ONCE PER TRAJ.	STDA0050
C	(3) READS DATA FOR 20 PHASES INTO PI AND IP ARRAY, CLEARING	STDA0060
C	CERTAIN DATA TO ZERO BETWEEN PHASES--ONCE PER TRAJ.	STDA0070
C	(4) RESETS CERTAIN COUNTERS, FLAGS, AND CONSTANTS AT THE	STDA0080
C	START OF EACH TRAJ.	STDA0090
C	(5) INITIALIZES VARIABLES OF INTEGRATION.	STDA0100
C	(6) CALLS MAINS TO INITIATE COMPUTATION OF THE FIRST	STDA0110
C	TRAJECTORY PHASE	STDA0120
C	INPUT GENERAL DATA STDATA MAINS DERIV	STDA0130
C	COMMON /FAILUR/ KFAIL	STDA0140
C	COMMON /NEWVPM/ VPM11(11), IVP4(4), VPM7(7),	STDA0150
1	ZSLOPE(20), ZTPHAZ(20), ZTOTAL(20), PMORE(20)	STDA0160
	EQUIVALENCE (PMORE(1), TPCMGN)	STDA0170
	COMMON /RJBLOK/ RJ(50)	STDA0180
	EQUIVALENCE (RJ(18), PCMGN)	STDA0190
	COMMON /PRINTR/ IZQ2(2), LAZRUS, IZQ4(4)	STDA0200
	COMMON /PERF / KRVPSM, KRVDRG, 74(4), NZ3(4), XMACHE(20), ALTE(20),	STDA0210
1	GAMMAF(20), FVALUE(20), XPITCH(10,20), YPITCH(10,20), ITERM(20),	STDA0220
2	NAERO(20), IPTYPE(20), MODES(20), MHGEN(20), ICONT(20),	STDA0230
3	ALPMAX(20), ANZMAX(20), FUSY(20)	STDA0240
	COMMON /TOVPER/ FUZ(10), KIZ, FUZE(4)	STDA0250
1	TVX, TVN, YISX(20), XTHR(20) , EXTRA(15)	STDA0260
	COMMON /BYAIR/ SRF, S1(20), S2(20), S3(20), S4(20), S5(20),	STDA0270
1	CL1(20), CL2(20), CL3(20), CL4(20), CL5(20),	STDA0280
3	DM1(20), DM2(20), DM3(20), DM4(20), DM5(20),	STDA0290
4	CD1(20,5), CD2(20,5), CD3(20,5), CD4(20,5), CD5(20,5)	STDA0300
	COMMON /CIBLK/ CI(1000)/BCDBLK/LINE1(20), LINE2(20)	STDA0310
C	INPUT GENERAL DATA NAMES	STDA0320
	EQUIVALENCE	STDA0330
1	(VELI, CI(1)), (XMACHI, CI(2)), (GAMMAI, CI(3)),	STDA0340
2	(ALTI, CI(4)), (TIMEI, CI(5)), (RANGEI, CI(6)),	STDA0350
3	(MOPT, CI(7)), (WTI, CI(8)), (MXSTEP, CI(9)),	STDA0360
4	(DSTART, CI(10)), (DMIN, CI(11)), (EREF, CI(12)),	STDA0370
5	(ERRFAC, CI(13)), (DELMAX, CI(14)), (DALPH, CI(15)),	STDA0380
*	(DALPH, DFCN(1)),	STDA0390
6	(DALT, CI(16)), (DMACH, CI(17)), (DCFN, CI(18)),	STDA0400
7	(DVCL, CI(19)), (DHCL, CI(20)), (NTRYS, CI(21)),	STDA0410
8	(JPRINT, CI(22)), (SAVE, CI(23)), (IPRNT2, CI(24)),	STDA0420
9	(GSTD, CI(25)), (RE, CI(26)), (NLPHAZ, CI(27)),	STDA0430
*	(NCPHAZ, CI(28)), (NDPHAZ, CI(29)), (WDRCF, CI(30)),	STDA0440

1	(ESTART, CI(31)), (AEXITI, CI(32)), (TVACI, CI(33)),	STDA0450
2	(XISPI, CI(34)), (WPROPB, CI(35)), (WPROPS, CI(36)),	STDA0460
3	(AEXITS, CI(37)), (IPROP1, CI(38)), (RTOL, CI(39)),	STDA0470
4	(TVACMX, CI(40)), (TVACMN, CI(41)), (NSETS, CI(42)),	STDA0480
5	(SRFF, CI(43)), (RJFLAG, CI(44)), (LINOUT, CI(45))	STDA0490
	EQUIVALENCE	STDA0500
*	(XTERTL, CI(61)), (YISP, CI(81)),	STDA0510
1	(SMACH1, CI(101)), (CLALF1, CI(121)),	STDA0520
2	(SMACH2, CI(141)), (CLALF2, CI(161)),	STDA0530
3	(SMACH3, CI(181)), (CLALF3, CI(201)),	STDA0540
4	(SMACH4, CI(221)), (CLALF4, CI(241)),	STDA0550
5	(SMACH5, CI(261)), (CLALF5, CI(281)),	STDA0560
6	(DMACH1, CI(302)), (CDO1, CI(321)),	STDA0570
7	(DMACH2, CI(422)), (CDO2, CI(441)),	STDA0580
8	(DMACH3, CI(542)), (CDO3, CI(561)),	STDA0590
9	(DMACH4, CI(662)), (CDO4, CI(681)),	STDA0600
*	(DMACH5, CI(782)), (CDO5, CI(801))	STDA0610
C	INPUT PHASE DATA STDATA MAINS DERIV	STDA0620
	COMMON/PIBLK/PI(70)/IPBLK/IP(10)/PSBLK/PS(70,20)/IPSBLK/IPS(10,20)	STDA0630
C		STDA0640
C	WORKING COMMON STDATA, MAINS, DERIV, CUTPUT	STDA0650
	COMMON/CBLK/C(400)/OUTBLK/PAGER(14,50)	STDA0660
	EQUIVALENCE	STDA0670
1	(RC, CI(1)), (Q, CI(2)), (QS, CI(3)),	STDA0680
2	(GRAV, CI(4)), (GRAVT, CI(5)), (GRAVN, CI(6)),	STDA0690
3	(TWOC, CI(7)), (THR, CI(8)), (THRQ, CI(9)),	STDA0700
4	(SSV, CI(10)), (RHO, CI(11)), (PRESS, CI(12)),	STDA0710
5	(VISC, CI(13)), (TEMP, CI(14)), (ALPHA, CI(15)),	STDA0720
6	(XMACH, CI(16)), (CDO, CI(17)), (CLAQS, CI(18)),	STDA0730
7	(CLALF, CI(19)), (CF, CI(20)), (WF, CI(21)),	STDA0740
8	(SFC, CI(22)), (TT4, CI(23)), (ANZ, CI(24)),	STDA0750
9	(ANX, CI(25)), (NITER, CI(26)), (NBCCST, CI(27)),	STDA0760
*	(NSPHA7, CI(28)), (IPRINT, CI(29)), (RSAVE, CI(30)),	STDA0770
1	(ETA, CI(31)), (TSAVE, CI(32)), (XTOL, CI(33)),	STDA0780
2	(NFRR, CI(34)), (ERLIMT, CI(35)), (NEQ, CI(36)),	STDA0790
3	(IDONE, CI(37)), (NDONE, CI(38)), (ERLOG, CI(39)),	STDA0800
4	(NBAD, CI(40)), (JSTEP, CI(41)), (TTOL, CI(42)),	STDA0810
5	(TMAX, CI(43)), (DELT, CI(44)), (KSUB, CI(45)),	STDA0820
6	(RATIO, CI(46)), (AK(1), CI(47)), (AW(1), CI(51)),	STDA0830
7	(KKK, CI(56)), (INDEX, CI(57))	STDA0840
	EQUIVALENCE	STDA0850
1	(TOUT, CI(58)), (IOUT, CI(59)), (NPHAZ, CI(60)),	STDA0860
2	(SINGAM, CI(73)), (COSGAM, CI(74)), (DALP, CI(75)),	STDA0870
3	(VMAS, CI(76)), (GDOTRO, CI(77)), (DEGRAD, CI(78)),	STDA0880
4	(TVAC, CI(79)), (AEXIT, CI(80)), (XISP, CI(81)),	STDA0890
5	(ACCN, CI(82)), (ACCT, CI(83)), (XNOW, CI(84)),	STDA0900
6	(WPR, CI(85)), (WEMPTY, CI(86)), (NPAGE, CI(87)),	STDA0910
7	(NOUT, CI(88)), (NLINES, CI(89)), (NCON, CI(90)),	STDA0920
8	(NMAP, CI(91)), (RNGI, CI(92)), (NTRY, CI(93)),	STDA0930
9	(ALTMAX, CI(94)),	STDA0940
*	(ISV(1), C(101)), (STLU(1), C(141))	STDA0950
C	INTEGRATION VARIABLES STDATA MAINS DERIV, CUTPUT	STDA0960
	DOUBLE PRECISION XPRIM1	STDA0970
	COMMON/RKBLK/X(10),XDOT(10),XPRIM1(10)	STDA0980
	EQUIVALENCE	STDA0990

1	(TIME,	X(1)),	(GAMMA,	X(2)),	(V,	X(3)),	STDA1000
2	(ALT,	X(4)),	(R,	X(5)),	(W,	X(6)),	STDA1010
3	(VI,	X(7)),					STDA1020
4			(GDOT,	XDOT(2)),	(VDOT,	XDOT(3)),	STDA1030
5	(HDOT,	XDOT(4)),	(RDOT,	XDOT(5)),	(WDOT,	XDOT(6)),	STDA1040
6	(VIDOT,	XDOT(7))					STDA1050
C	ATMOSPHERE SUBROUTINE COMMUNICATION			DERIV,STCATA,MAINS			STDA1060
	COMMON/AIRPLK/ALTA,			TEMPA,	RHOA,	PRESSA, SSVA,	STDA1070
1	VISCA						STDA1080
C	DIMENSION STATEMENT FOR			MAINS, DERIV			STDA1090
	DIMENSION						STDA1100
1	YISP(20),		XTHRTL(20),		SMACH1(20),		STDA1110
2	SMACH2(20),		SMACH3(20),		SMACH4(20),		STDA1120
3	SMACH5(20),		CLALF1(20),		CLALF2(20),		STDA1130
4	CLALF3(20),		CLALF4(20),		CLALF5(20),		STDA1140
5	DMACH1(20),		DMACH2(20),		DMACH3(20),		STDA1150
6	DMACH4(20),		DMACH5(20),		CD01(20,5),		STDA1160
7	CD02(20,5),		CD03(20,5),		CD04(20,5),		STDA1170
8	CD05(20,5),						STDA1180
9	DECO(4),		STLU(20,6),		ISV(12),		STDA1190
*	AK(4),	AW(4)					STDA1200
	COMMON/TRAJX/TRAJA(10)/RJDAT/RJDATA(9)/EXTERN/AR(20)/						STDA1210
1	CODEXX/II(16)						STDA1220
	EQUIVALENCE			(FARMAX,TRAJA(7)),	(TT4MAX,TRAJA(8)),		STDA1230
1	(ESLRO,TRAJA(9)),	(ICODE,TRAJA(10)),	(A5A3,RJDATA(3)),				STDA1240
2	(A6A3,RJDATA(4)),	(ACA3,RJDATA(5)),	(D3,AR(3)),				STDA1250
3	(KIND,II(1)),	(IND,TRAJA(6))					STDA1260
	DATA BLANK/4H /						STDA1270
C	SAVE1=SAVE						STDA1280
C	SET COMMON BLOCKS TO ZERO						STDA1290
	DO 10 I=1,1000						STDA1300
10	CI(I)=0.						STDA1310
C	DO 20 I=1,400						STDA1320
20	C(I)=0.						STDA1330
C	DO 30 I=1,70						STDA1340
30	PI(I)=0.						STDA1350
C	DO 40 I=1,10						STDA1360
40	IP(I)=0						STDA1370
C	DO 60 J=1,50						STDA1380
	DO 60 I=1,14						STDA1390
60	PAGEB(I,J)=0.						STDA1400
C	DO 70 J=1,20						STDA1410
	DO 70 I=1,70						STDA1420
70	PS(I,J)=0.						STDA1430
C	DO 80 J=1,20						STDA1440
	DO 80 I=1,10						STDA1450
80	IPS(I,J)=0						STDA1460
C							STDA1470
							STDA1480
							STDA1490
							STDA1500
							STDA1510
							STDA1520
							STDA1530
							STDA1540

C		STDA1550
C	SFT BUILT-IN INPUT GENERAL DATA	STDA1560
	SAVE=1.	STDA1570
	NSETS = 2	STDA1580
	ESTART = 0.	STDA1590
	IPRNT2 = 1	STDA1600
	IF (LAZRUS .EQ. 0) IPRNT2 = 0	STDA1610
	LINGUT = LAZRUS	STDA1620
	EPRINT = 0.	STDA1630
C	SFE FUSY	STDA1640
	PJFLAG = 0.	STDA1650
	CSTD=32.17405	STDA1660
	RE=20.9E6	STDA1670
C	RANGE TOLERANCE IN NMI	STDA1680
C	XTOL IS THE TIME TOLERANCE FOR PHASE DEPENDENT VARIABLE STOPS	STDA1690
	XTOL=0.0005	STDA1700
	DO 100 I=1,20	STDA1710
	LINE1(I)=BLANK	STDA1720
	100 LINE2(I)=BLANK	STDA1730
C		STDA1740
C	BUILT-IN PHASE DATA CONSTANTS APPLY TO FIRST AND ALL SUBSEQUENT	STDA1750
C	PHASES UNLESS ALTERED BY INPUT DATA	STDA1760
	NCON=0	STDA1770
	ICODE=0	STDA1780
C	SFT NAMELIST VALUES INTO ACTIVE CORE	STDA1790
	PCMGH = TPCMGH	STDA1800
	CALPH = VPM11(1)	STDA1810
	CALT = VPM11(2)	STDA1820
	CCFN = VPM11(3)	STDA1830
	DFLMAX= VPM11(4)	STDA1840
	DFCL = VPM11(5)	STDA1850
	DMACH = VPM11(6)	STDA1860
	DMIN = VPM11(7)	STDA1870
	DSTART= VPM11(8)	STDA1880
	EVCL = VPM11(9)	STDA1890
	ERFF = VPM11(10)	STDA1900
	ERRFAC= VPM11(11)	STDA1910
	IPROP1=IVPM4(1)	STDA1920
	JPRINT=IVPM4(2)	STDA1930
	MXSTEP= IVPM4(3)	STDA1940
	NTRY5=IVPM4(4)	STDA1950
	RANGEI=VPM7(1)	STDA1960
	RTOL=VPM7(2)	STDA1970
	TIMEI=VPM7(3)	STDA1980
	GKG=VPM7(4)	STDA1990
	GKV=VPM7(5)	STDA2000
	GKVCPU=VPM7(6)	STDA2010
	CTOPT=VPM7(7)	STDA2020
C	FROM PSM OR NAM77	STDA2030
	VFLI = Z4(1)	STDA2040
	XMACHI = Z4(2)	STDA2050
	GAMMAI = Z4(3)	STDA2060
	ALTI = Z4(4)	STDA2070
	MOPT = NZ3(1)	STDA2080
	NLPHAZ = NZ3(2)	STDA2090

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NCPHAZ = NZ3(3)
NDPHAZ = NZ3(4)
KIND = KIZ
WPROPP = FUZ(1)
XISPI = FUZ(2)
TVACI = FUZ(3)
AFEXIT = FUZ(4)
WPROPS = FUZ(5)
AFXITS = FUZ(6)
WTI = FUZ(8)
WDROP = FUZ(9)
IF ( KIND .EQ. 42 ) WDROP = FUZ(10)
NTEN = 10
NKIND = MOD ( KIND, NTEN )
IF ( NKIND .EQ. 3 ) WDROP = FUZ(10)
ASA3 = FUZE( 1)
AEA3 = FUZE( 2)
ACA3 = FUZE( 3)
E3 = FUZE( 4)
TVACMX = TVX
TVACMN = TVN
DO 1215 I=1,20
YISP(I) = YISX(I)
XTPRTL(I) = XTHR(I)
1215 CONTINUE
C LOAD PHASE DATA INTO ACTIVA ARRAYS
DO 130 J=1,NLPHAZ
IPS( 1 ,J) = ITERM (J)
IPS( 2 ,J) = NAERO (J)
IPS( 3 ,J) = IPTYPE (J)
IPS( 4 ,J) = MODES (J)
IPS( 5 ,J) = MHGEN (J)
IPS( 6 ,J) = ICONT (J)
PS( 1 ,J) = XMACHF (J)
PS( 2 ,J) = ALTF (J)
PS( 3 ,J) = GAMMAF (J)
PS( 6 ,J) = FVALUE (J)
PS( 8 ,J) = ALPMAX (J)
PS( 9 ,J) = ANZMAX (J)
PS(4,J) = ZTPHAZ(J)
PS(5,J)=ZTOTAL(J)
PS(7,J)=ZSLOPE(J)
PS( 10, J ) = FUSY(J)
FUZPOP = 0.0
IF ( IPTYPE(J) .LE. 2 ) FUZPOP = FUZ(7)
PS( 11, J ) =FUZPOP
PS( 12 ,J) = GTOPT
PS( 13 ,J) = GKV
PS( 14 ,J) = GKG
PS( 15 ,J) = GKVCRU
DO 1212 I=1,10
NUX = 20 + I
NUXX= 40 + I
PS(NUX,J) = XPITCH (I,J)
PS(NUXX,J) = YPITCH(I,J)

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STDA2100
STDA2110
STDA2120
STDA2130
STDA2140
STDA2150
STDA2160
STDA2170
STDA2180
STDA2190
STDA2200
STDA2210
STDA2220
STDA2230
STDA2240
STDA2250
STDA2260
STDA2270
STDA2280
STDA2290
STDA2300
STDA2310
STDA2320
STDA2330
STDA2340
STDA2350
STDA2360
STDA2370
STDA2380
STDA2390
STDA2400
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STDA2440
STDA2450
STDA2460
STDA2470
STDA2480
STDA2490
STDA2500
STDA2510
STDA2520
STDA2530
STDA2540
STDA2550
STDA2560
STDA2570
STDA2580
STDA2590
STDA2600
STDA2610
STDA2620
STDA2630
STDA2640

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1212	CONTINUE	STDA2650
	GO 1213 I = 1, 10	STDA2660
	NUX = 30	STDA2670
	NUXX = 50	STDA2680
	PS(NUX+I, J) = XPITCH(NUX,J)	STDA2690
	PS(NUXX+I, J) = YPITCH(NUXX,J)	STDA2700
1213	CONTINUE	STDA2710
130	CONTINUE	STDA2720
C	FROM AM OR NAM78	STDA2730
	SREF = SRF	STDA2740
	DO 1100 I=1,20	STDA2750
	SMACH1 (I) = S1 (I)	STDA2760
	SMACH2 (I) = S2 (I)	STDA2770
	SMACH3 (I) = S3 (I)	STDA2780
	SMACH4 (I) = S4 (I)	STDA2790
	SMACH5 (I) = S5 (I)	STDA2800
	CLALF1 (I) = CL1 (I)	STDA2810
	CLALF2 (I) = CL2 (I)	STDA2820
	CLALF3 (I) = CL3 (I)	STDA2830
	CLALF4 (I) = CL4 (I)	STDA2840
	CLALF5 (I) = CL5 (I)	STDA2850
	DMACH1 (I) = DM1 (I)	STDA2860
	DMACH2 (I) = DM2 (I)	STDA2870
	DMACH3 (I) = DM3 (I)	STDA2880
	DMACH4 (I) = DM4 (I)	STDA2890
	DMACH5 (I) = DM5 (I)	STDA2900
	DO 1101 J=1,5	STDA2910
	CD01 (I,J) = CD1 (I,J)	STDA2920
	CD02 (I,J) = CD2 (I,J)	STDA2930
	CD03 (I,J) = CD3 (I,J)	STDA2940
	CD04 (I,J) = CD4 (I,J)	STDA2950
	CD05 (I,J) = CD5 (I,J)	STDA2960
1101	CONTINUE	STDA2970
1100	CONTINUE	STDA2980
C		STDA2990
C		STDA3000
C	RESET COUNTERS, FLAGS, AND CONSTANTS AT THE START OF EACH	STDA3010
C	TRAJECTORY	STDA3020
	DEGRAD=57.29578	STDA3030
	DALP=0.001	STDA3040
C		STDA3050
C	RUNGE KUTTA CONSTANTS	STDA3060
	AK(2)=0.5	STDA3070
	AK(3)=0.5	STDA3080
	AK(4)=1.0	STDA3090
	AW(1)=1./6.	STCA3100
	AW(2)=AW(1)+AW(1)	STDA3110
	AW(4)=AW(1)	STCA3120
	AW(3)= 1.-(AW(1) + AW(2) + AW(4))	STCA3130
	NEQ =7	STDA3140
	ERLOG=ALOG(EREF)	STDA3150
	ERLIMT=EREF*ERRFAC	STDA3160
C		STCA3170
	IDONF=84	STDA3180
C	NPHAZ IS PHASE COUNTER	STDA3190

NPHAZ=0	STCA3200
NCON=NCON+1	STDA3210
NTRY=0	STDA3220
JSTEP=0	STDA3230
NRAD=0	STCA3240
NOUT=0	STDA3250
NLINES=0	STDA3260
IPRINT=1	STDA3270
TWOG=2.*GSTD	STDA3280
NMAP=0	STCA3290
AL TMAX=1.E8	STCA3300
C	STCA3310
C IDENTIFY FIRST BOOST PHASE	STCA3320
DO 150 I=1,NLPHAZ	STDA3330
IF(IPS(3,I).GT. 2) GO TO 150	STDA3340
IF(IPS(3,I).EQ.0) GO TO 150	STCA3350
NBOOST=1	STCA3360
GO TO 160	STDA3370
150 CONTINUE	STDA3380
C	STDA3390
C IDENTIFY FIRST SUSTAINER PHASE	STDA3400
160 CONTINUE	STDA3410
DO 180 I=1,NLPHAZ	STCA3420
IF(IPS(3,I) .LT. 3) GO TO 180	STCA3430
NSPHAZ=1	STDA3440
GO TO 190	STCA3450
180 CONTINUE	STDA3460
C	STDA3470
C	STDA3480
C DETERMINE IF ITERATION FOR FUEL EXHAUSTION CRUISE RANGE IS TO BE DONE	STCA3490
190 CONTINUE	STDA3500
IF(NCPHAZ .EQ. 0 .OR. NCPHAZ .GT. NLPHAZ) GO TO 195	STCA3510
NITER=1	STDA3520
RNGI= PS(6,NCPHAZ)	STDA3530
IF(RNGI .LT. 0.1) RNGI=1.	STCA3540
C INITIALIZE VARIABLES OF INTEGRATION	STDA3550
195 CONTINUE	STCA3560
DO 196 I=1,40	STDA3570
196 X(I)=0.	STCA3580
XPRIM1(1)=TIMEI	STDA3590
XPRIM1(2)=GAMMAI/DEGRAD	STDA3600
XPRIM1(4)=ALTI	STDA3610
XPRIM1(5)=RANGEI*6076.115	STCA3620
XPRIM1(6)=WTI	STDA3630
XDOT(1)=1.00	STCA3640
IF (MDPT .GT. 0) GO TO 200	STDA3650
V =VELI	STDA3660
GO TO 210	STDA3670
200 CONTINUE	STDA3680
ALTA=ALTI	STCA3690
CALL AIR	STCA3700
IF(KFAIL.GT.0) RETURN	STDA3710
V =XMACHI*SSVA	STDA3720
210 XPRIM1(3)= AMAX1(V, 0.100)	STDA3730
CALL MAINS1	STDA3740

RETURN
END

STDA3750
STDA3760

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SUBROUTINE TURBO(KFAIL)
REAL KSTR, LBARE
REAL*4 INP20
COMMON /COMVLS/ COM(51)
EQUIVALENCE (COM(23), FNETX),
1 (COM(24), WTX),
2 (COM(25), WFX),
3 (COM(26), FMAX),
4 (COM(28), T4X),
5 (COM(29), METTJX)
COMMON/AL TDD/
LK1, ALT(24), SDTEMP(24), PRESS(24), ID(8)
COMMON /BAC/ BAC72(72)
EQUIVALENCE ( BAC72(67), WDOTF )
EQUIVALENCE ( BAC72(71), FN )
COMMON /DESIGN/ DEN69(69), A999, DEN10(10)
COMMON /DESOPT/ KENG, KTANK, KINLT, METAL, ISTR, DES20(20)
EQUIVALENCE ( ZCG, DES20(2) )
EQUIVALENCE ( IDIFF, DES20(1) )
COMMON/EXTEPN/ ARR(20)
EQUIVALENCE (ARR(1), PLLT), (ARR(3), D3), (ARR(14), TANLT)
1, (ARR(15), AR), (ARR(16), XMZERO), (ARR(17), XMRJTO), (ARR(18), HEIGHT),
1 (ARR(19), ROSTLT)
COMMON /GENFAL/ KEGEN
COMMON /INCOMM/XLDUMP, XFERNG, XINLET, XTIPCL, STERM, TNCZL
COMMON /INDATA/ CDINL, CLALF, WEIGHT
EQUIVALENCE (WEIGHT, WINL)
COMMON/INDES/ XINDO(16)
COMMON/INLETX/K8, KPTC(15), ALPHV(15), AAMACH(15,15), ACACC(15,15),
1 PT3PTO(15,15), ADDO(15,15)
COMMON/INPTTJ/ FND, ALPDES, AMDES, T4DES, INP20(20)
COMMON/IPROP/ INCL, IN3(3)
EQUIVALENCE ( TV(19) , ETAR )
EQUIVALENCE (KSTR, INP20(1)) , (DCASE, INP20(2)), (WTTJ, INP20(3)),
1 (XLPAY, INP20(4)), (RHOF, INP20(5)), (REH, INP20(6)),
2 (WPL, INP20(8)), (XLMISC, INP20(9)), (WSTRI, INP20(10)),
3 (WCVAST, INP20(11))
EQUIVALENCE ( WMISTJ, INP20(13) )
EQUIVALENCE (WASURF, INP20(14)), (WBOOST, INP20(15))
COMMON /PRINTR/ IPSM, IPLK6(6)
COMMON /TJINLP/ XENG, RENG, XMISSL
COMMON/TURBI/ TV(30)
EQUIVALENCE ( TV(2), ALFTJ )
EQUIVALENCE (AC, TV(8)), (TJALT, TV(3)), (DFTIP, TV(9))
6, (A9, TV(10)), (T4TJ, TV(6)), (TJMACH, TV(4)), (TJTHR, TV(5))
EQUIVALENCE(WAFCD, TV(1))
EQUIVALENCE (WFUFL, TV(11)), (XTOTAL, TV(12)),
1 (XLP, TV(13)), (XLNOZ, TV(14))
COMMON/WATES/ WT, LBARE, DTT, DRF, DFTXP, DMAX, WAT20(20)
COMMON/WATIN/ WAT7(7), OPR, RFAN, TIT, WAT3(3)
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TURBO110
TURBO20
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TURBO450
TURBO460
TURBO470
TURBO480
TURBO490
TURBO500

EQUIVALENCE (OPR,PRC),(TIT,T4)	TURB0510
DIMENSION G(15,15)	TURB0520
NAMelist/TANK/ XLTW,WSH,WFS,AWT,WWT,VOLWT,ASKINP,WSTRPS,WSUM,XCYL,	TURB0530
1 VOLTNK,WFUEL,XLPS,XTOTAL	TURB0540
NAMelist/WAK/ T0,T2,P2,WC,P3,T3,P4,T55,XE,P55,P8,T8,VE,VC,GA,WAK2	TURB0550
NAMelist/CHK/ WAFCDs,WAF,XLNOZ,DNOZ,SEXT,SNOZ,ALNCZ,WNOZ,	TURB0560
1 XBARNZ,RENGO,XENG,XLENG,INP20	TURB0570
NAMelist/CHECK/ TV,ARR	TURB0580
C COMPUTE CORRELATED AIRFLOW FOR INPUT THRUST, M, T4	TURB0590
CWT = .01 * TJTHR	TURB0600
DCASE = D3	TURB0610
CTANK = DCASE	TURB0620
XMISSL = 4. * PLLT	TURB0630
ILOO = 1	TURB0640
ILOOM = 3	TURB0650
KFAIL = 0	TURB0660
RHZF = RHOF	TURB0670
PI=3.14159	TURB0680
AMACH=TJMACH	TURB0690
AM=TJMACH	TURB0700
XMZERO = TJMACH	TURB0710
T4=T4TJ	TURB0720
ETARIN = 0.9	TURB0730
HP=TJALT	TURB0740
CALL TLUI(HP,ALT,K1,PRESS,PO,IND)	TURB0750
CALL TLUI1(SDTEMP,T0)	TURB0760
T2 = T0 * (1.+0.2*AM*AM)	TURB0770
P2 = PO * ETARIN * (T2/T0)**3.5	TURB0780
WC = 0.3 * T2 * (PRC**0.286 - 1.)	TURB0790
P3 = P2 * PRC	TURB0800
T3 = T2 * (1. + WC/(0.24*T2))	TURB0810
P4 = 0.95 * P3	TURB0820
T55 = T4 - WC / 0.276	TURB0830
XE = WC / (0.248*T4-WC)	TURB0840
P55 = P4 * (XE + 1.)**(-3.5)	TURB0850
P8 = 0.506 * P55	TURB0860
T8 = T55 / 1.165	TURB0870
VE = 47.8 * SQRT(T8)	TURB0880
VO = 49. * AM * SQRT(T0)	TURB0890
FND=TJTHR	TURB0900
GA = FND/((VE/32.174)+(P8-PO)*53.3*T8/(P8*VE)-VO/32.174)	TURB0910
WAK2 = GA * SQRT(T2/519.) / (P2/2116.25)	TURB0920
IF (IPSM.GT.0) WRITE(6,CHECK)	TURB0930
IF (IPSM .GT. 0) WRITE(6,WAK)	TURB0940
10 ICES = 0	TURB0950
WAFCDs = WAK2	TURB0960
XMCR = 1.0	TURB0970
CALL INLET(WAK2,TJMACH, XMCR, ALFTJ, ETARIN,ETAROT,ACAP,IDES,CD)	TURB0980
IF (KFGEN .GT. 0) GO TO 995	TURB0990
ETAR = ETARIN	TURB1000
C COMPUTE ADDITIVE DRAG + BLEED DRAG	TURB1010
CALL GENENG	TURB1020
IF (KFGEN .GT. 0) GO TO 995	TURB1030
ILOO = ILOO + 1	TURB1040
IF (ILOO .GT. ILOOM) GO TO 995	TURB1050

DW = ABS (FND - FN)	TURB1060
IF (DW .LT. DWT) GO TO 20	TURB1070
WAK2 = WAK2 * FND / FN	TURB1080
GO TO 10	TURB1090
20 AM=TJMACH	TURB1100
AS = A999	TURB1110
DYNP=0.7*PO*AM*AM	TURB1120
DAPBL = CD * DYNP * ACAP / 144.	TURB1130
FNET = FN - DAPBL	TURB1140
SFC = WDTF / FNET	TURB1150
WAF=WAFCD5*(P2/2116.25)/ SQRT(T2/518.6)	TURB1160
CALL WATE(WAF)	TURB1170
C WATE OUTPUTS ENGINE LENGTH, DIAMETER, WEIGHT	TURB1180
C NOZZLE WEIGHT	TURB1190
XLNOZ=1.6*DFTIP	TURB1200
DNOZ=SQRT(4.*A9/PI*144.)	TURB1210
SFXIT=A9	TURB1220
SNOZ=SQRT(XLNOZ**2 + 0.25*(DFTIP**2-DNOZ**2))	TURB1230
ALNOZ=PI*SNOZ*(0.5*DFTIP + 0.5*DNOZ)	TURB1240
WNOZ=3.25*ALNOZ/144.	TURB1250
WENG = WT + WNOZ	TURB1260
XBARNZ=XLNOZ*(0.5*DFTIP + DNOZ)/3./(0.5*DFTIP + 0.5*DNOZ)	TURB1270
RENGO = 0.5 * DFTIP	TURB1280
XFNG=LRAPE + XLNOZ	TURB1290
XLENG = XENG + 2.0 * RENGO	TURB1300
IF (IPSM .GT. 0) WRITE(6,CKK)	TURB1310
IF (PMAX .GT. DCASE) GO TO 995	TURB1320
CALL INLEXP	TURB1330
IF (INDL .GT. 0) GO TO 995	TURB1340
C INLETP COMPUTED INLET & DUCT LENGTH, WEIGHT, LOCATION . . .	TURB1350
C METAL = 1, ALUMINUM	TURB1360
C = 2, TITANIUM	TURB1370
C = 3, STEEL	TURB1380
GO TO (40, 50, 60), METAL	TURB1390
40 RHOMTL = 0.1	TURB1400
E = 10.47F6	TURB1410
GO TO 70	TURB1420
50 RHOMTL = 0.167	TURB1430
E = 15.89 F6	TURB1440
GO TO 70	TURB1450
60 RHOMTL = 0.29	TURB1460
E = 28.86E6	TURB1470
70 TC = 2.725 * DTANK / E**0.4	TURB1480
IF (TC .LT. 0.03) TC = 0.03	TURB1490
XLTW = 0.6667 * XINLET	TURB1500
IF (KENG .GT. 1) XLTW = 0.5 * XINLET	TURB1510
TERMA = (0.5 * DTANK - TC - 0.03)**2	TURB1520
XLFH = 0.5 * DTANK/REH	TURB1530
TERMB = (XLFH - TC - 0.03) * PI * 0.6667	TURB1540
XLAH = XLFH	TURB1550
VOLHD = TERMA * TERMB	TURB1560
REH2 = REH * REH	TURB1570
TERMC = SQRT(REH2 - 1.)	TURB1580
TERMD = 0.3925 / (REH * TERMC)	TURB1590
TERMC = (REH + TERMC) / (REH - TERMC)	TURB1600

	SH = DTANK**2 * (0.7854 + TERMD * ALOG(TERMC))	TURB1610
	WSH = SH * TC * RHOMTL	TURB1620
	XLFS = 0.5 * DTANK / REH	TURB1630
	WFS = PI * DTANK * XLFS * RHOMTL * TC	TURB1640
	WAS = WFS	TURB1650
	RHOF = RHOF / 1728.	TURB1660
	WWT = 0.0	TURB1670
	VOLWT = 0.0	TURB1680
	IF (KTANK .GT. 1) GO TO 95	TURB1690
C	WEDGE TANK COMPUTATIONS	TURB1700
	APWT = 0.25 * PI * XLTW * DTANK	TURB1710
	ALWT = 0.5 * PI * DTANK * XLTW	TURB1720
	AWT = ABWT + ALWT	TURB1730
	WLWT=ALWT*RHOMTL*TC	TURB1740
	WWT = AWT * RHOMTL * TC	TURB1750
	WPWT=WWT-WLWT	TURB1760
	VOLW = 0.125 * PI * XLTW * DTANK**2	TURB1770
	VOLWT = VOLW + VOLHD	TURB1780
	ASKINP = PI * DCASE * (XLENG + 0.5*XLTW + XLMISC)	TURB1790
	ASKINW=PI*DCASE*XLTW*0.5	TURB1800
65	GO TO (75, 80, 85), ISTR	TURB1810
75	WSTRPS = ASKINP * TC * RHOMTL * KSTR	TURB1820
	GO TO 90	TURB1830
80	WSTRPS = ASKINP * WOVAST * KSTR	TURB1840
	GO TO 90	TURB1850
85	WSTRPS = WSTRI	TURB1860
90	CONTINUE	TURB1870
	WSUM=WPL+WASURF+WMISTJ+WENG+WINL+WSTRPS+WFS	TURB1880
	IF (KTANK .GT. 1) GO TO 95	TURB1890
	XCYL=(WTTJ - WSUM -WSH-WWT-RHOF*VOLHD-VOLW*RHOF)/(0.7854*DTANK**2	TURB1900
	1 +PI*DTANK*TC*RHOMTL)	TURB1910
C		TURB1920
	VOLTNK = (VOLHD + VOLWT + 0.25*PI*DTANK**2*XCYL) * 0.95	TURB1930
	GO TO 100	TURB1940
95	ASKINP = PI * DTANK * (XLENG + XLTW + XLMISC - XLAH)	TURB1950
	GO TO 65	TURB1960
96	XCYL = (WTTJ-WSUM-2.0*WSH-WAS-RHOF*VOLHD*2.0)/(0.7854*DTANK**2+PI	TURB1970
	1*DTANK*TC*RHOMTL)	TURB1980
	IF (XCYL .LE.0.0) GO TO 990	TURB1990
97	VOLCYL = PI*DTANK**2 * XCYL * 0.25	TURB2000
	VOLTNK = (VOLHD * 2.0 + VOLCYL) * 0.95	TURB2010
100	WFUEL = VOLTNK * RHOF	TURB2020
	WCYL = PI * DTANK * XCYL * TC * RHOMTL	TURB2030
	WTANK=WCYL + WWT + WSH	TURB2040
	IF(KTANK.GT.1) WTANK=WCYL + 2.*WSH	TURB2050
	WPS = WTTJ - WPL - WASURF	TURB2060
	XLPS = XLENG + XLTW + XCYL + XLFH + XLMISC	TURB2070
	IF (KTANK.GT.1) XLPS=XLENG+XLTW+XCYL+XLFH+XLMISC	TURB2080
	XTOTAL = XLPS + XLPAY	TURB2090
	DINL=SQRT(4.*TV(8)*144./PI)	TURB2100
	XLTANK=XLTW + XCYL + XLFH	TURB2110
	IF(KTANK.GT.1) XLTANK=XCYL + XLFH + XLAH	TURB2120
C	C C OF PROPULSION SYSTEM	TURB2130
C	ADD CG COMPUTATIONS HERE	TURB2140
	XBAR1=0.5*XLMISC	TURB2150

	XMM1=XPAR1*(WMISTJ + PI*DCASE*XLMISC*TC*RHOMTL)	TURB2160
	XPAR2=XLMISC + 0.5*XLFH	TURB2170
	XMM2=XBAR2*WFS	TURB2180
	XPAR3=XPAR2	TURB2190
	XMM3=XBAR3*WSH	TURB2200
	XPAR4=XPAR3 + 0.5*(XLFH + XCYL)	TURB2210
	XMM4=XPAR4*WCYL	TURB2220
	IF(KTANK.GT.1) GO TO 110	TURB2230
	XPAR5=XPAR4 + 0.5*XCYL + XLTW/3.	TURB2240
	XMM5=XPAR5*WLWT	TURB2250
	XPAR6=XPAR4 + 0.5*XLTW	TURB2260
	XMM6=XPAR6*WPWT	TURB2270
	XPAR7=XLMISC + XLFH + XCYL + XLTW*0.667	TURB2280
	XMM7=XPAR7*ASKINW*RHOMTL*TC	TURB2290
	GO TO 120	TURB2300
110	XPAR5=XPAR4 + 0.5*XCYL + 0.5*XLAH	TURB2310
	XMM5=XPAR5*WSH	TURB2320
	XPAR6=XPAR5	TURB2330
	XMM6=XPAR6*WSH	TURB2340
	XPAR7=XPAR6 + 0.5*XLTW	TURB2350
	XMM7=XPAR7*PI*DTANK*RHOMTL*(XLTW-XLAH)	TURB2360
120	XPAR8=XLMISC + XLFH + XCYL + 0.5*XLENG + XLTW	TURB2370
	XMM8=XPAR8*(WSTEPS - ASKINW*RHOMTL*TC)	TURB2380
	XPAR9=XLPS - XLNOZ - 0.5*XENG	TURB2390
	XMM9=XPAR9*WENG	TURB2400
	XBARIN=7CG	TURB2410
	XMMIN=XBARIN*WEIGHT	TURB2420
	XPAR10=XLPS - XLNOZ + XBARNZ	TURB2430
	XMM10=WNOZ + XBAR10	TURB2440
	XMM=XMM1 + XMM2 + XMM3 + XMM4 + XMM5 + XMM6 + XMM7	TURB2450
1	+XMM8 + XMM9 + XMM10	TURB2460
	XCGPSE=XMM/WPS	TURB2470
	XBARFL=XBAR4	TURB2480
	IF(KTANK.GT.1) XBARFL=(VOLHD*RHOF*XBAR3 + RHOF*XBAR4*VOLCYL +	TURB2490
1	VOLWT*RHOF*(XBAR5 + 0.17*XLTW))/WFUEL	TURB2500
	XMMFL=WFUEL*XBARFL	TURB2510
	XMMF=XMM + XMMFL	TURB2520
	XCGPSE=XMMF/(WPS + WFUEL)	TURB2530
	FNETX = TJTHR	TURB2540
	FMAX = TJTHR	TURB2550
	WTX=WTANK	TURB2560
	WFX = WFUEL	TURB2570
	T4X=T4	TURB2580
	MFTTJX = METAL	TURB2590
	IF(IPSM.NE.0) WRITE(6,1000)	TURB2600
1000	FORMAT(/9X, 26HTURROJET DESIGN PARAMETERS)	TURB2610
	IF(IPSM.NE.0) WRITE(6,1050) TJMACH,TJALT,TJTHR,T4TJ	TURB2620
1050	FORMAT(/9X, 13HDESIGN MACH =,F4.2,4X,16HDESIGN ALTITUDE=,F6.0,4H	TURB2630
	1T.,/9X, 14HDESIGN THRUST=,F8.2,5H LBS,4X,11HDESIGN T4 =,F7.2)	TURB2640
	IF(IPSM.NE.0) WRITE(6,1100)	TURB2650
1100	FORMAT(/9X, 10HCOMPONENT ,4X,12HDIAMETER-IN.,4X,10HLENGTH-IN.,4X,	TURB2660
	11HWEIGHT-LBS.,4X,17HC.G. LOCATION-IN.)	TURB2670
	IF(IPSM.NE.0) WRITE(6,1200) DMAX,XENG,WENG, XBAR9	TURB2680
1200	FORMAT(/10X,6HENGINE,10X,F5.2,9X,F6.2,8X,F7.2,10X,F6.2)	TURB2690
	IF(IPSM.NE.0) WRITE(6,1300)DNOZ,XLNOZ,WNOZ,XBAR10	TURB2700

1300	FORMAT(/10X,6PNOZZLF,10X,F5.2,9X,F6.2,8X,F7.2,10X,F6.2)	TURB2710
	IF(IPSM.NE.0) WRITE(6,1400) DINL,XINLET,WEIGHT,XBARIN	TURB2720
1400	FORMAT(/10X,5HINLET,11X,F5.2,9X,F6.2,8X,F7.2,10X,F6.2)	TURB2730
	IF(IPSM.NE.0) WRITE(6,1500) DTANK,XLTANK,WTANK	TURB2740
1500	FORMAT(/10X,4HTANK,12X,F5.2,9X,F6.2,8X,F7.2,10X,F6.2)	TURB2750
	IF(IPSM.NE.0) WRITE(6,1600) WSTRPS,XBAR7	TURB2760
1600	FORMAT(/10X,4HSTR.,40X,F7.2,1CX,F6.2)	TURB2770
	IF(IPSM.NE.0) WRITE(6,1700) WMISTJ,XBAR8	TURB2780
1700	FORMAT(/10X,5HMISC.,39X,F7.2,10X,F6.2)	TURB2790
	IF(IPSM.NE.0) WRITE(6,1800) DMAX,XLPS,WPS,XCGPSE	TURB2800
1800	FORMAT(/10X,10HPROP SYS.,6X,F5.2,9X,F6.2,8X,F7.2,10X,F6.2)	TURB2810
	IF(IPSM.NE.0) WRITE(6,1900) DTANK,XLTANK,WFUEL,XBAR5	TURB2820
1900	FORMAT(/10X,4HFUEL,12X,F5.2,9X,F6.2,8X,F7.2,10X,F6.2)	TURB2830
	GO TO 9951	TURB2840
9950	KFAIL = 1	TURB2850
	IF (IPSM .LE. 0) GO TO 1177	TURB2860
	WRITE(6,1)	TURB2870
1	FORMAT(20HTANK CYLINDER LENGTH .LE. ZERO)	TURB2880
	GO TO 996	TURB2890
9955	CONTINUE	TURB2900
	KFAIL=1	TURB2910
9951	CONTINUE	TURB2920
	IF (IPSM .LE. 0) GO TO 1177	TURB2930
	WRITE(6,TANK)	TURB2940
1177	CONTINUE	TURB2950
996	CONTINUE	TURB2960
	RHOE = RHZF	TURB2970
	RETURN	TURB2980
	END	TURB2990

	SUBROUTINE CARD(N5,N6,NX, CLAS,PCODE)	CARD0010
C	EGM=MAINAA(TYPE B) L.D.G. VER. 2 10-25-74 FORT IV ERCD	CARD0020
C	TO READ CARD IMAGES FROM N5, COPY ONTO NX, AND PRINT ON N6	CARD0030
1000	FORMAT(20A4)	CARD0040
1001	FORMAT(1X,19A4,A3)	CARD0050
2000	FORMAT(16,1H.,20A4)	CARD0060
2001	FORMAT(16,1H.,1X,19A4,A3)	CARD0070
2002	FORMAT(6X,17HINPUT CARD IMAGES/)	CARD0080
	DIMENSION KARD(20),CLAS(20),PCODE(20)	CARD0090
	DATA KZIP,K10/4HZIP,4H10 /	CARD0100
	K1 = 1	CARD0110
	KCARD = 2	CARD0120
	NLINE = 2	CARD0130
	WRITE(N6,2002)	CARD0140
	WRITE(NX, 1001) CLAS, PCODE	CARD0150
	WRITE(N6,2001) K1, CLAS, KCARD, PCODE	CARD0160
	GO TO 2	CARD0170
1	NLINE = 0	CARD0180
	WRITE(N6,2002)	CARD0190
2	NLINE = NLINE + 1	CARD0200
	KCARD = KCARD + 1	CARD0210
	READ (N5,1000) KARD	CARD0220
	WRITE(NX, 1000)KARD	CARD0230

AD-A048 366

LTV AEROSPACE CORP DALLAS TEX VOUGHT SYSTEMS DIV

F/G 15/7

SEATIDE ANALYSIS PROCESS. VOLUME III E. CRUISE MISSILE - CONCEP--ETC(U)

FEB 75 R K MCDONOUGH

DAAB09-72-C-0062

UNCLASSIFIED

VSD-00.1636-VOL-3E-REV-A

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END
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DDC

WRITE(N6,2000) KCARD, KARD
 IF (KARD(1).EQ.KZIP.AND.KARD(2).EQ.K10) GO TO 8
 IF (NLINE.LT.50) GO TO 2
 CALL PAGE
 GO TO 1
 END FILE NX
 REWIND NX
 RETURN
 END

CARD0240
 CARD0250
 CARD0260
 CARD0270
 CARD0280
 CARD0290
 CARD0300
 CARD0310
 CARD0320

SUBROUTINE INCOST(IZIP,INPRIN) INCO0010
 REAL NOZWT,MP INCO0020
 COMMON /CONLY/ KINDPS,DIAFRT,SHMC,SDTHRT,SRNOZI,SHM,SCMMOR(4) INCO0030
 COMMON /SCRNNL/ NPTS(20),PARVNL(7,20),DWNL(7,20),DUMMY(50) INCO0040
 1 ,NSCOST,IDU4M4(4) INCO0050
 COMMON /GUIDCN/ COSN,NSCRC,WTGUID,SAWTI(3),SAWTJ(3),SAFCI(3), INCO0060
 1 SAFCJ(3),KSASTR,KSAAGT,NSACHN,KSASGT,AWTI(3),AWTJ(3), INCO0070
 2 APPEKI(3),APPEKJ(3),AFCI,AFCEJ,KASTR,KAAGT,NACHN,KASGT, INCO0080
 3 GIRWT(3),GIRRSP(3),GIRNOT(3),GIRFC(3),KGTABL,KGTYPE, INCO0090
 4 DUMGX(9) INCO0100
 COMMON /COMVLS/ WTANK,VEXIN,VREQ,GGW,HPPUMP,UTFUEL,WCOMM,VCCMT, INCO0110
 1 R5,Y1,WMOZ,KFM,WATTK,A,DCOM,WMC,VRI,DTHT,RNNOZI,NCZWT,MP,CASEM, INCO0120
 2 ENET,WT,WF,EMAX,S,T4,METTJ,ZXNB,D,WM,FC,PPEAK,BSP,NCET,QA,WCS, INCO0130
 3 WWH,WTC,WTP,WGG,WSC,WLV,VT,WC,WP,DP,WN,METAL,NCONFG INCO0140
 COMMON /COSTIN/ PRIA1,PRIA2,PRJC,PRIA3,PRI83,PRIA4,PRIE4,PRIA5, INCO0150
 1PRIA6,PRIA7,PRIAE,PRI88,PRIA9,PRIG9,PRIA10,PRIA11,PRIG11,PRIA12, INCO0160
 2PRI12,PRIE12,PRIA13,PRIE13,PRIA14,PRIE14,PRIA15,PRIE15,PRIA16, INCO0170
 3PRIE16,PRIA17,PRIE17,PRIA18,PRI18,PRIE18,PRIA19,PRIE19,PRIA20, INCO0180
 4PRIA21,PRIA22,PRI822,PRIA23,PRI823,PRIC23,PRIA24,PRIC24,PRIA25, INCO0190
 5PRI825,PRIA26,PRI826,PRIC26,PRNA1,PRNA2,PRNA3,PRNB3,PRNA4,PRNE4, INCO0200
 6PRNA5,PRNA6,PRNA7,PRNA8,PRNB8,PRNA9,PRNG9,PRNA10,PRNA11,PRNG11, INCO0210
 7PRNA12,PRNB12,PRNE12,PRNA13,PRNE13,PRNA14,PRNE14,PRNA15,PRNA16, INCO0220
 8PRNA17,PRNA18,PRNB18,PRNA19,PRNB19,PRNC19,PRNA20,PRNC20,PRNA21, INCO0230
 9PRNB21,PRNA22,PRNB22,PRNC22,PLPC,PLA1,PLA3,PLB3,PLA4,PLA6,PLA8, INCO0240
 APLB8,PLA9,PLA11,PLB11,PLA13,PLB13,PLC13,PLD13,PLA14,PLD14,PLA15, INCO0250
 BPLB15,PLF15,PLF15,PLA16,PLE16,PLA17,PLA18,PLB18,PLC18,PLA19,PLA20, INCO0260
 CPLB20,PLA21,PLB21,PLC21,PTA1,PTD1,PTA4,PTB4,PTA5,PTB5,PTC5,PTA6, INCO0270
 DPTC6,PTA7,PTB7,PTC7,PTJC,PTA8,PTD8,PTA9,PTB9,PTA10,PTB10,PTC10, INCO0280
 EPEA3,PEB3,PEA4,PEE4,PEA5,PEF5,PEA6,PEB6,PEE6,PEA7,PEE7,PEA8,PEA9, INCO0290
 FPEA10,PEB10,PEC10,PEA11,PEB11,PEE11,PEB8,PSPC,PSA3,PSB3,PSA4,PSF4, INCO0300
 GPSA5,PSF5,PSA6,PSF6,PSG6,PSA7,PSF7,PSA8,PSA9,PSA10,PSB10,PSC10, INCO0310
 HPSA11,PSB11,PSF11,CFT,PFT,CFCASF,PECASE,CFC,PFC,CFM,PFM,IYEAR INCO0320
 COMMON /COSTIN/ PRI81,PRIC1,PRIB2,PRIC2,PRI84,PRIC4,PRID4,PRI85, INCO0330
 1PRIC5,PRI89,PRIC9,PRID9,PRIE9,PRIF9,PRI811,PRIC11,PRID11,PRIE11, INCO0340
 2PRIF11,PRIC12,PRID12,PRI813,PRIC13,PRID13,PRI814,PRIC14,PRID14, INCO0350
 3PRI815,PRIC15,PRID15,PRI816,PRIC16,PRID16,PRI817,PRIC17,PRID17, INCO0360
 4PRIE17,PRIC18,PRID18,PRI819,PRIC19,PRID19,PRI824,PRNB1,PRNC1,PRNB2 INCO0370
 5,PRNC2,PRNB4,PRNC4,PRND4,PRNB5,PRNC5,PRNB9,PRNC9,PRND9,PRNE9,PRNE9 INCO0380
 6,PRNB11,PRNC11,PRND11,PRNE11,PRNF11,PRNC12,PRND12,PRNB13,PRNC13, INCO0390
 7PRND13,PRNB14,PRNC14,PRND14,PRNB15,PRNC15,PRND15,PRNE16,PRNC16, INCO0400
 8PRND16,PRNB17,PRNC17,PRND17,PRNE17,PRNB20,PLB1,PLC1,PLA2,PLB2,PLB4 INCO0410
 9,PLC4,PLA5,PLB5,PLB6,PLC6,PLA7,PLB7,PLB9,PLC9,PLA10,PLB10,PLA12, INCO0420
 APLB12,PLB14,PLC14,PLC15,PLD15,PLB16,PLC16,PLD16,PLB19,PLC19,PTB1, INCO0430

EPTC1,PTA2,PTB2,PTA3,PTB3,PTC5,PTD5,PTB6,PTC6,PTD6,PTB8,PTC8,PEA1, INC00440
 CPER1,PEC1,PEA2,PEB2,PEC2,PEB4,PEC4,PED4,PEB5,PEC5,PED5,PEE5,PEC6, INC00450
 CPED6,PEP7,PEC7,PED7,PEC11,PED11,PSA1,PSB1,PSC1,PSA2,PSB2,PSC2,PSB4,INC00460
 E,PSC4,PSD4,PSB5,PSC5,PSD5,PSE5,PSB6,PSC6,PSD6,PSE6,PSB7,PSC7,PSC7,INC00470
 FPSE7,PSC11,PSD11,PRND22,PLD21,PLE21,PTD10,PTE10,PRID26 INC00480
 COMMON /COSTIN/ PROFIT,QD,R, AFA1,AFB1,AFC1,AFD1,AFI1,AFA2,AFB2, INC00490
 1AFG2,AFA3,AFB3,AFG3,AFA4,AFB4,AFC4,AFD4,AFJ4,AFA5,AFB5,AFC5,AFH5, INC00500
 2AFA6,AFB6,AFG6,AFA7,AFB7,AFD7,AFB8,AFB8,AFC8,AFD8,AFI8,AFA9,AFB9, INC00510
 3AFC9,AFB9,AFJ9,AFA10,AFB10,AFC10,AFH10,AFA11,AFB11,AFG11,AFA12, INC00520
 4AFC12,AFD12,AFA13,AFB13,AFC13,AFA14,AFB14,AFC14,KFUZE,WA1,WE1,WF1,INC00530
 5WA2,WD2,WE2,KGAIN,CA1,CE1,CF1,CA2,CE2,CF2,CA3,CE3,CF3,GA1,GB1,GF1,INC00540
 6KLE6,KGT6,KSTAB,KAGATE,NCHAN,KSGATE,GA2,GB2,GK2,GA3,GB3,GQ3,GA4, INC00550
 7CR4,GM4,GA5,GB5,GH5,KG,KC,KW,KA,KP,IGTYPE,ICTYPE,IPRST INC00560
 COMMON /COSTIN/ AFF1,AFF1,AFG1,AFH1,AFC2,AFD2,AFF2,AFF2,AFC3, INC00570
 1AFD3,AFF3,AFF3,AFF4,AFF4,AFG4,AFH4,AFI4,AFD5,AFF5,AFF5,AFG5,AFC6, INC00580
 2AFD6,AFF6,AFF6,AFF8,AFF8,AFG8,AFH8,AFF9,AFF9,AFG9,AFH9,AFI9, INC00590
 3AFD10,AFF10,AFF10,AFG10,AFC11,AFD11,AFF11,AFF11,AFB12,WB1,WC1,WD1,INC00600
 4WP2,WC2,CB1,CC1,CD1,CB2,CC2,CD2,CB3,CC3,CD3,GC1,GD1,GE1,GC2,GD2, INC00610
 5CF2,CF2,GG2,GH2,GI2,GJ2,GC3,GD3,GE3,GF3,GG3,GH3,GI3,GJ3,GK3,GL3, INC00620
 6CM3,CN3,GP3,GC4,GD4,GE4,GF4,GG4,GH4,GI4,GJ4,GK4,GL4,GC5,GD5,GE5, INC00630
 7CF5,GC5,CFTTAB(11),PFTTAB(11) INC00640
 COMMON /CSTPRV/ CBLC,CBMC,CCASE,CCFU,CCL,CCM,CCOMI,CCOML,CCOMM, INC00650
 1 CCONT,CCRD,CBFC,CEBRD,CFTJ,CEXIN,CGFU,CGRD, INC00660
 2 CGT,CGTOT,CIGN,CIRJFU, CIRJRD, CLF,CLFL,CLGG,CLI,CLM, INC00670
 3 CLRFD,CLRRD,CLRT,CLTC,CLTP,CM,CMGG,CMP,CMTC,CMT, INC00680
 4 CMV,CNOZ,CNRJFU, CNRJRD, CP,CPAFI,CPENG,CFL,CPLC, INC00690
 5 CPMFCL,CPMFGM,CPOA,CPR,CPRC,CPS,CPSMGG,CPSN2,CPSRAM,CPSSGG, INC00700
 6 CPTOOL,CRAFI,CRDEV,CREG,CRENG,CRFTO,CRJC,CRMFGI,CRMFGM,CRQA, INC00710
 7 CRTOOL,CSA,CSRFD,CSRRO,CSRT,CT,CTAFI,CTC,CTEB,CTIRJ,CTJFU, INC00720
 8 CTJLF,CTJFL,CTJRD,CTJT, CTL,CTM,CTNRJ,CTP,CWH,CWHFU,CWHR, INC00730
 9 CBODC,CRPS,CPFU,PROFPR,PRUAF,PRRAF,CCLB,CCMB,CTCB,CLIB,CNOZB, INC00740
 A CPRB,CPLB,CIGNB,CSAB,PROFEX INC00750
 COMMON /CODEXX/ II(16) INC00760
 EQUIVALENCE (II(1),KIND) INC00770
 COMMON /VFILES/ N5,N6,N7,N11,N12,N1 INC00780
 NAMELIST /NAMCST/ QD, R,IYEAR,NSCRC,NSCOST,KGTABL, INC00790
 1 KGTYPF,WTGUID,FC,BSP,PPEAK,NDET,KSTAB,KAGATE,NCHAN,KSGATE, INC00800
 2 ICTYPE,KGAIN,KFUZE INC00810
 NAMELIST /NAMCBY/ WTANK,VEXIN,VREQ,GGW,HPPUMP,WTFUEL,WCOMM,VCCMI, INC00820
 1 R5,Y1,WNOZ,KFM,MATTK, DCOM,WMC,VBI,DTHT, RNOZI,NCZWT,MP,CASEM, INC00830
 2 FNET,WT,WF,FMAX, T4,METTJ,ZXNB, WM, WCS, INC00840
 3 WWH,WTC,WTP,WGG,WSC,WLV,VGT,WQ,WP,DP,WN,METAL, INC00850
 4 A,D,CIAFRT,KINDPS INC00860
 5 ,SWMC,SDHTRT,SRNOZI,SWM,KG,KC,KW,KA,KP INC00870
 5 ,QA,S INC00880
 NAMELIST /NAMCPS/ PRIA1,PRIA2,PRJC,PRIA3,PRI83,PRIA4,PRIE4,PRIA5, INC00890
 1PRIA6,PRIA7,PRIA8,PRI88,PRIA9,PRIG9,PRIA10,PRIA11,PRIG11,PRIA12, INC00900
 2PRI812,PRIE12,PRIA13,PRIE13,PRIA14,PRIE14,PRIA15,PRIE15,PRIA16, INC00910
 3PRIE16,PRIA17,PRIF17,PRIA18,PRI818,PRIE18,PRIA19,PRIE19,PRIA20, INC00920
 4PRIA21,PRIA22,PRI822,PRIA23,PRI823,PRIC23,PRIA24,PRIC24,PRIA25, INC00930
 5PRI825,PRIA26,PRI826,PRIC26,PRNA1,PRNA2,PRNA3,PRNB3,PRNA4,PRNE4, INC00940
 6PRNA5,PRNA6,PRNA7,PRNA8,PRNB8,PRNA9,PRNG9,PRNA10,PRNA11,PRNG11, INC00950
 7PRNA12,PRNB12,PRNE12,PRNA13,PRNE13,PRNA14,PRNE14,PRNA15,PRNA16, INC00960
 8PRNA17,PRNA18,PRNB18,PRNA19,PRNB19,PRNC19,PRNA20,PRNC20,PRNA21, INC00970
 9PRNB21,PRNA22,PRNB22,PRNC22,PLPC,PLA1,PLA3,PLB3,PLA4,PLA6,PLAB, INC00980


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APLB8,PLA9,PLA11,PLB11,PLA13,PLB13,PLC13,PLD13,PLA14,PLD14,PLA15, INCO0990
RPLB15,PLE15,PLF15,PLA16,PLE16,PLA17,PLA18,PLB18,PLC18,PLA19,PLA20, INCO1000
CPLB20,PLA21,PLB21,PLC21,PTA1,PTD1,PTA4,PTB4,PTA5,PTB5,PTC5,PTA6, INCO1010
CPTF6,PTA7,PTB7,PTC7,PTJC,PTA8,PTD8,PTA9,PTB9,PTA10,PTB10,PTC10, INCO1020
EPEA3,PER3,PEA4,PEE4,PEA5,PEF5,PEA6,PEB6,PEE6,PEA7,PEE7,PEA8,PEA9, INCO1030
FPEA10,PER10,PFC10,PEA11,PEB11,PEF11,PEBC,PSPC,PSA3,PSB3,PSA4,PSE4, INCO1040
GPSA5,PSF5,PSA6,PSF6,PSG6,PSA7,PSF7,PSA8,PSA9,PSA10,PSB10,PSC10, INCO1050
FPSA11,PSB11,PSE11,CFT,PFT,CFCASE,PFCASE,CFC,PFC,CFM,PFM INCO1060
X ,PLC14 INCO1070
NAMELIST /NAMCCP/ PRIB1,PRIC1,PRIB2,PRIC2,PRIB4,PRIC4,PRID4,PRIP5, INCO1080
1PRIC5,PRIB9,PRIC9,PRID9,PRIE9,PRIF9,PRIB11,PRIC11,PRID11,PRIF11, INCO1090
2PRIF11,PRIC12,PRID12,PRIB13,PRIC13,PRID13,PRIB14,PRIC14,PRID14, INCO1100
3PRIB15,PRIC15,PRID15,PRIB16,PRIC16,PRID16,PRIB17,PRIC17,PRID17, INCO1110
4PRIF17,PRIC18,PRID18,PRIB19,PRIC19,PRID19,PRIB24,PRNB1,PRNC1,PRNB2 INCO1120
5,PRNC2,PRNB4,PRNC4,PRND4,PRNB5,PRNC5,PRNB9,PRNC9,PRNC9,PRNF9,PRNF9 INCO1130
6,PRNB11,PRNC11,PRND11,PRNE11,PRNF11,PRNC12,PRND12,PRNB13,PRNC13, INCO1140
7PRND13,PRNB14,PRNC14,PRND14,PRNB15,PRNC15,PRND15,PRNB16,PRNC16, INCO1150
8PRND16,PRNB17,PRNC17,PRND17,PRNF17,PRNB20,PLB1,PLC1,PLA2,PLB2,PLB4 INCO1160
9,PLC4,PLA5,PLB5,PLB5,PLC6,PLA7,PLB7,PLB9,PLC9,PLA10,PLB10,PLA12, INCO1170
APLB12,PLB14, PLC15,PLD15,PLB16,PLC16,PLD16,PLE19,PLC19, INCO1180
P PTA2,PTB2,PTA3,PTB3,PTC5,PTD5,PTB6,PTC6,PTD6,PTB8,PTC8,PEA1, INCO1190
CPFB1,PFC1,PEA2,PEB2,PFC2,PEB4,PEC4,PEO4,PEB5,PEC5,PEC5,PEE5,PEC6, INCO1200
CPED6,PEB7,PFC7,PEO7,PFC11,PEO11,PSA1,PSB1,PSC1,PSA2,PSB2,PSC2,PSB4 INCO1210
E,PSC4,PSD4,PSB5,PSC5,PSD5,PSE5,PSB6,PSC6,PSD6,PSE6,PSB7,PSC7,PSD7, INCO1220
FPSE7,PSC11,PSD11,PRND22,PLD21,PLE21,PTD10,PTD10,PRIC26 INCO1230
X ,PTB1,PTC1 INCO1231
NAMELIST /NAMCNP/ PROFIT, AFA1,AFB1,AFC1,AFD1,AFI1,AFA2,AFB2, INCO1240
1AFG2,AFA3,AFB3,AFG3,AFA4,AFB4,AFC4,AFD4,AFJ4,AFA5,AFB5,AFC5,AFH5, INCO1250
2AFA6,AFB6,AFG6,AFA7,AFC7,AFD7,AFA8,AFB8,AFC8,AFD8,AFI8,AFA9,AFB9, INCO1260
3AFC9,AFD9,AFJ9,AFA10,AFB10,AFC10,AFH10,AFA11,AFB11,AFG11,AFA12, INCO1270
4AFC12,AFD12,AFA13,AFB13,AFC13,AF A14,AFB14,AFC14, WA1,WE1,WF1, INCO1280
5WA2,WD2,WE2, CA1,CE1,CF1,CA2,CE2,CF2,CA3,CE3,CF3,GA1,CB1,GF1, INCO1290
6 GA2,GB2,GK2,GA3,GB3,GQ3,GA4, INCO1300
7GP4,CM4,GA5,GB5,GH5 INCO1310
NAMELIST /NAMCCN/ AFE1,AFF1,AFG1,AFH1,AFC2,AFD2,AFF2,AFF2,AFC3, INCO1320
1AFC3,AFF3,AFF3,AFF4,AFG4,AFH4,AFI4,AFD5,AFF5,AFF5,AFG5,AFC6, INCO1330
2AFD6,AFF6,AFF6,AFB7,AFF8,AFF8,AFG8,AFH8,AFF9,AFF9,AFG9,AFH9,AFI9, INCO1340
3AFD10,AFF10,AFF10,AFG10,AFC11,AFD11,AFF11,AFF11,AFB12,WB1,WC1,WD1, INCO1350
4WP2,WC2,CB1,CC1,CD1,CB2,CC2,CD2,CB3,CC3,CD3,GC1,GD1,GE1,GC2,GD2, INCO1360
5CF2,GF2,GG2,GH2,GI2,GJ2,GC3,GD3,GE3,GF3,GG3,GH3,GI3,GJ3,GK3,GL3, INCO1370
6GM3,GN3,GP3,GC4,GD4,GE4,GF4,GG4,GH4,GI4,GJ4,GK4,GL4,GC5,GD5,GE5, INCO1380
7CF5,GG5 INCO1390
C INCO1400
GO TO (30,40,50,60,70,80),IZIP INCO1410
30 READ(N5,NAMCNP) INCO1420
IF(INPRIN.GT.0) WRITE(N6,NAMCNP) INCO1430
GO TO 10 INCO1440
40 READ(N5,NAMCCN) INCO1450
IF(INPRIN.GT.0) WRITE(N6,NAMCCN) INCO1460
GO TO 10 INCO1470
50 READ(N5,NAMCPS) INCO1480
IF(INPRIN.GT.0) WRITE(N6,NAMCPS) INCO1490
GO TO 10 INCO1500
60 READ(N5,NAMCCP) INCO1510
IF(INPRIN.GT.0) WRITE(N6,NAMCCP) INCO1520

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	GO TO 10	INCO1530
7C	READ(N5,NAMCBY)	INCO1540
	FMAX = FNET	INCO1550
	IF(INPRIN.GT.C) WRITE(N6,NAMCBY)	INCO1560
	GO TO 10	INCO1570
80	CONTINUE	INCO1580
	READ(N5,NAMCST)	INCO1590
	IF(KGTABL .LE. 0) GO TO 2498	INCO1600
	NV=3	INCO1610
	IF(KGTYPE .GT. 12) GO TO 2428	INCO1620
	IF (KGTYPE .NE. 11) GO TO 2408	INCO1630
C	I BAND PASSIVE - SEMIACTIVE	INCO1640
	CALL SLU(NV,SAWTI,SAFCI,WTGUID,FC,ILO,IHI)	INCO1650
	GO TO 2419	INCO1660
C	J BAND PASSIVE - SEMIACTIVE	INCO1670
2408	CONTINUE	INCO1680
	CALL SLU(NV,SAWTJ,SAFCJ,WTGUID,FC,ILO,IHI)	INCO1690
2418	CONTINUE	INCO1700
	KSTAB=KSASTB	INCO1710
	KAGATE = KSAAGT	INCO1720
	NCHAN = NSACHN	INCO1730
	KSGATE = KSASGT	INCO1740
	GO TO 2498	INCO1750
2428	CONTINUE	INCO1760
	IF (KGTYPE .GT. 22) GO TO 2458	INCO1770
	IF (KGTYPE .NE. 21) GO TO 2438	INCO1780
C	I BAND ACTIVE	INCO1790
	CALL SLU(NV,AWTI,APPEKI,WTGUID,PPEAK,ILO,IHI)	INCO1800
	FC=AFCI	INCO1810
	GO TO 2448	INCO1820
2438	CONTINUE	INCO1830
C	J BAND ACTIVE	INCO1840
	CALL SLU(NV,AWTJ,APPEKJ,WTGUID,PPEAK,ILO,IHI)	INCO1850
	FC=AF CJ	INCO1860
2448	CONTINUE	INCO1870
	KSTAB=KASTB	INCO1880
	KAGATE = KAAGT	INCO1890
	NCHAN = NACHN	INCO1900
	KSGATE = KASGT	INCO1910
	GO TO 2498	INCO1920
2458	CONTINUE	INCO1930
	IF (KGTYPE .GT. 31) GO TO 2498	INCO1940
C	IR SYSTEM	INCO1950
	CALL SLU(NV,GIRWT,GIRBSP,WTGUID,BSP,ILO,IHI)	INCO1960
	CALL SLU(NV,GIRWT,GIRNDT,WTGUID,NDET,ILO,IHI)	INCO1970
	CALL SLU(NV,GIRWT,GIRFC,WTGUID,FC,ILO,IHI)	INCO1980
2458	CONTINUE	INCO1990
	IGTYPE = 1	INCO2000
	IF ((KGTYPE.GT.12) .AND. (KGTYPE.LT.31)) IGTYPE = 2	INCO2010
	IF(KGTYPE.GE.31) IGTYPE=4	INCO2020
	IF(INPRIN.GT.0) WRITE(N6,NAMCST)	INCO2030
10	CONTINUE	INCO2040
	RETURN	INCO2050
	END	INCO2060

SUBROUTINE COST(ICNO)	COST0010
COMMON /COSTSC/ CTOT,CPTOT,CRTOT,COMPC(17)	COST0020
COMMON /CONLY/ KIND,DIAFRT,SOMMOR(8)	COST0030
COMMON /SCRNNL/ SCR351(351), IDU4M4(4)	COST0040
EQUIVALENCE (IDU4M4(3), ICOST)	COST0050
COMMON /QACOST/ QMAXQ, VMAXQ, DUMQA(8)	COST0060
COMMON /BASVAR/ DBASR(8), TAREA, DBAS11(11)	COST0070
REAL NOZWT,MP	COST0080
COMMON /COMVLS/ WTANK,VEXIN,VREQ,GGW,HPPUMP,WTFUEL,WCCMM,VCOMI,	COST0090
1 R5,Y1,WNOZ,KFM,MATTK,A,DCOM,WMC,VBI,DTHRT,RNOZI,NCZWT,MP,CASEM,	COST0100
2 FNET,WT,WF,FMAX,S,T4,MFTTJ,ZXNB,D,WM,FC,PPEAK,BSP,NDET,QA,WCS,	COST0110
3 WWW,WTC,WTP,WGG,WSC,WLV,VTG,WO,WP,DP,WN,METAL,NCONFG	COST0120
COMMON /COSTIN/ PRIA1,PRIA2,PRJC,PRIA3,PRI83,PRIA4,PRIE4,PRIA5,	COST0130
1PRIA6,PRIA7,PRIA8,PRI88,PRIA9,PRIG9,PRIA10,PRIA11,PRIG11,PRIA12,	COST0140
2PRI12,PRIE12,PRIA13,PRIE13,PRIA14,PRIE14,PRIA15,PRIE15,PRIA16,	COST0150
3PRIE16,PRIA17,PRIE17,PRIA18,PRI818,PRIE18,PRIA19,PRIE19,PRIA20,	COST0160
4PRIA21,PRIA22,PRI822,PRIA23,PRI823,PRIC23,PRIA24,PRIC24,PRIA25,	COST0170
5PRI825,PRIA26,PRI826,PRIC26,PRNA1,PRNA2,PRNA3,PRNB3,PRNA4,PRNF4,	COST0180
6PRNA5,PRNA6,PRNA7,PRNA8,PRNB8,PRNA9,PRNG9,PRNA10,PRNA11,PRNG11,	COST0190
7PRNA12,PRNB12,PRNE12,PRNA13,PRNE13,PRNA14,PRNE14,PRNA15,PRNA16,	COST0200
8PRNA17,PRNA18,PRNB18,PRNA19,PRNB19,PRNC19,PRNA20,PRNC20,PRNA21,	COST0210
9PRNB21,PRNA22,PRNB22,PRNC22,PLPC,PLA1,PLA3,PLB3,PLA4,PLA6,PLA8,	COST0220
APLB8,PLA9,PLA11,PLB11,PLA13,PLB13,PLC13,PLD13,PLA14,PLD14,PLA15,	COST0230
PLB15,PLE15,PLF15,PLA16,PLE16,PLA17,PLA18,PLB18,PLC18,PLA19,PLA20,	COST0240
CPLB20,PLA21,PLB21,PLC21,PTA1,PTD1,PTA4,PTB4,PTA5,PTB5,PTC5,PTA6,	COST0250
PTC6,PTA7,PTB7,PTC7,PTJC,PTA8,PTD8,PTA9,PTB9,PTA10,PTB10,PTC10,	COST0260
EPFA3,PEP3,PEA4,PEE4,PEA5,PEF5,PEA6,PEB6,PEE6,PEA7,PEE7,PEA8,PEA9,	COST0270
FPEA10,PEB10,PEC10,PEA11,PEB11,PEE11,PEBC,PSPC,PSA3,PSB3,PSA4,PSE4,	COST0280
CPSA5,PSF5,PSA6,PSF6,PSG6,PSA7,PSF7,PSA8,PSA9,PSA10,PSB10,PSC10,	COST0290
HPSA11,PSB11,PSE11,CFT,PFT,CFCASE,PFCASE,CFC,CFM,PFM,IYEAR	COST0300
COMMON /COSTIN/ PRI81,PRIC1,PRI82,PRIC2,PRI84,PRIC4,PRID4,PRI85,	COST0310
1PRIC5,PRI89,PRIC9,PRID9,PRIE9,PRIF9,PRI811,PRIC11,PRID11,PRIF11,	COST0320
2PRIF11,PRIC12,PRID12,PRI813,PRIC13,PRID13,PRI814,PRIC14,PRID14,	COST0330
3PRI815,PRIC15,PRID15,PRI816,PRIC16,PRID16,PRI817,PRIC17,PRID17,	COST0340
4PRIE17,PRIC18,PRID18,PRI819,PRIC19,PRID19,PRI824,PRNE1,PRNC1,PRNB2	COST0350
5,PRNC2,PRNB4,PRNC4,PRND4,PRNB5,PRNC5,PRNB9,PRNC9,PRND9,PRNE9,PRNF9	COST0360
6,PRNB11,PRNC11,PRND11,PRNE11,PRNF11,PRNC12,PRND12,PRNB13,PRNC13,	COST0370
7PRND13,PRNB14,PRNC14,PRND14,PRNB15,PRNC15,PRND15,PRNB16,PRNC16,	COST0380
8PRND16,PRNB17,PRNC17,PRND17,PRNE17,PRNB20,PLB1,PLC1,PLA2,PLB2,PLB4	COST0390
9,PLC4,PLA5,PLB5,PLB6,PLC6,PLA7,PLB7,PLB9,PLC9,PLA10,PLB10,PLA12,	COST0400
APLB12,PLB14,PLC14,PLC15,PLD15,PLB16,PLC16,PLD16,PLB19,PLC19,PTB1,	COST0410
BPTC1,PTA2,PTB2,PTA3,PTB3,PTC5,PTD5,PTB6,PTC6,PTD6,PTB8,PTC8,PEA1,	COST0420
CPEB1,PEC1,PEA2,PEB2,PEC2,PEB4,PEC4,PED4,PEB5,PEC5,PED5,PEE5,PEC6,	COST0430
CPED6,PEB7,PEC7,PED7,PEC11,PED11,PSA1,PSB1,PSC1,PSA2,PSB2,PSC2,PSR4	COST0440
E,PSC4,PSD4,PSB5,PSC5,PSD5,PSE5,PSB6,PSC6,PSD6,PSE6,PSB7,PSC7,PSD7,	COST0450
FPSE7,PSC11,PSD11,PRND22,PLD21,PLE21,PTD10,PTC10,PRID26	COST0460
COMMON /COSTIN/ PROFIT,QD,R,AFA1,AFB1,AFC1,AFD1,AFI1,AFA2,AFB2,	COST0470
1AFG2,AFA3,AFB3,AFG3,AFA4,AFB4,AFC4,AFD4,AFJ4,AFA5,AFB5,AFC5,AFH5,	COST0480
2AFA6,AFB6,AFG6,AFA7,AFC7,AFD7,AFA8,AFB8,AFC8,AFD8,AFI8,AFA9,AFB9,	COST0490
3AFC9,AFD9,AFJ9,AFA10,AFB10,AFC10,AFH10,AFA11,AFB11,AFG11,AFA12,	COST0500
4AFC12,AFD12,AFB13,AFC13,AFA14,AFB14,AFC14,KFUZE,WA1,WE1,WF1,	COST0510
5WA2,WD2,WE2,KGAIN,CA1,CE1,CF1,CA2,CE2,CF2,CA3,CE3,CF3,GA1,GB1,GF1,	COST0520
6KLE6,KGT6,KSTAB,KAGATE,NCHAN,KSGATE,GA2,GB2,GK2,GA3,GB3,GQ3,GA4,	COST0530
7GB4,GM4,GA5,GB5,GH5,KG,KC,KW,KA,KP,IGTYPE,ICTYPE,I PRCT	COST0540
COMMON /COSTIN/ AFE1,AFF1,AFG1,AFH1,AFC2,AFD2,AFE2,AFF2,AFC3,	COST0550


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1AFD3,AFE3,AFF3,AFE4,AFF4,AFG4,AFH4,AFI4,AFD5,AFE5,AFF5,AFG5,AFH6, COST0560
2AFD6,AFE6,AFF6,AFB7,AFF8,AFF8,AFG8,AFH8,AFE9,AFF9,AFG9,AFH9,AFI9, COST0570
3AFD10,AFE10,AFF10,AFG10,AFH10,AFF11,AFD11,AFE11,AFF11,AFB12,WB1,WC1,WD1, COST0580
4WR2,WC2,CB1,CC1,CD1,CB2,CC2,CD2,CB3,CC3,CD3,GC1,GD1,GE1,GC2,GD2, COST0590
5CE2,GF2,GG2,GH2,GI2,GJ2,GC3,GD3,GE3,GF3,GG3,GH3,GI3,GJ3,GK3,GL3, COST0600
6CM3,GN3,GP3,GC4,GD4,GE4,GF4,GG4,GH4,GI4,GJ4,GK4,GL4,GC5,GD5,GE5, COST0610
7GF5,GG5,CFTTAB(11),PFTTAB(11) COST0620
COMMON /CSTPRV/ CRLC,CBMC,CCASE,CCFU,CCL,CCM,CCOMI,CCCML,CCCM, COST0630
1 CCONT,CCRD,CEBFU,CEBRD,CETJ,CEXIN,CGFU,CGRD, COST0640
2 CGT,CGTOT,CIGN,CIRJFU, CIRJRD, CLF,CLFL,CLGG,CLI,CLM, COST0650
3 CLRFU,CLPRD,CLRT,CLTC,CLTP,CM,CMGG,CMH,CMTC,CMT, COST0660
4 CMV,CNOZ,CNRJFU, CNRJRD, CP,CPAFI,CPENG,CFL,CPLC, COST0670
5 CPMFGL,CPMFGM,CPOA,CPR,CPRC,CPS,CPSMG,CPNS2,CPSRAM,CPSSGG, COST0680
6 CPTOOL,CRAFI,CRDEV,CREG,CRENG,CRFTD,CRJC,CRMFG,CRMFGM,CROA, COST0690
7 CRTOOL,CSA,CSRFB,CSRFD,CST,CTAFI,CTC,CTEB,CTIRJ,CTJFU, COST0700
8 CTJLF,CTJLFL,CTJRD,CTJT, CTL,CTH,CTNRJ,CTP,CWH,CWHFU,CWHR, COST0710
9 CBOOC,CRPS,CPFU,PROFPR,PRFUAF,PRRAF,CCLB,CCMB,CTCB,CLIB,CNOZR, COST0720
4 CPRB,CPLB,CIGNB,CSAB,PROFEX COST0730
DIMENSION DUMMY(1) COST0740
EQUIVALENCE (CRLC,DUMMY(1)) COST0750
DIMENSION COMV(51), ICOMV(51) COST0760
EQUIVALENCE ( COMV(1), WTANK), ( ICOMV(1), WTANK ) COST0770
NAMELIST /NCOU/ COMV,ICOMV,KSTAB,KAGATE,NCHAN,KSGATE, COST0780
1 KG,KC,KW,KA,KP,IGTYPE,ICTYPE COST0790
2 ,KIND,DIAFRT,SOMMOR COST0800
3 ,QMAXQ,VMAXQ,DUMQA,TAREA,QASAV,SSAV COST0810
QASAV = QA COST0820
SSAV = S COST0830
IF ( QMAXQ .GT. 0.0 ) QA = QMAXQ * TAREA / 144. / 1000. COST0840
IF ( VMAXQ .GT. 0.0 ) S = VMAXQ * 3600. / 6076.1155 COST0850
IF ( ICOST.NE.0) CALL PAGE COST0860
IF( ICOST.GT.1) WRITE(6,NCOU) COST0870
DO 80 I=1,104 COST0880
80 DUMMY(I)=0.0 COST0890
WTANX=0.0 COST0900
IF ((KIND .GE. 20) .AND. (KIND .LT. 30)) WTANX=WT COST0910
IF ((KIND .GE. 40) .AND. (KIND .LT. 50)) WTANX=WTANK COST0920
IF (KIND .GE. 50) WTANX=WT COST0930
AZ=A+WTANX COST0940
IF (KG .EQ. 0) CALL GUCOST COST0950
IF (KC .EQ. 0) CALL CTCOST COST0960
IF (KW .EQ. 0) CALL WHCOST COST0970
IF (KA .EQ. 0) CALL AAICST(AZ,DUMMY,1) COST0980
IF (KP .NE. 0) GO TO 50 COST0990
IF (KIND .NE. 10 .AND. KIND .NE. 13) GO TO 10 COST1000
CALL PSRCST COST1010
IF (KIND .EQ. 13) CALL PEBST COST1020
GO TO 50 COST1030
10 IF (KIND .NE. 20 .AND. KIND .NE. 23) GO TO 20 COST1040
CALL PLRST COST1050
IF (KIND .EQ. 23) CALL PEBST COST1060
GO TO 50 COST1070
20 IF (KIND .NE. 41) GO TO 30 COST1080
CALL PIRCST COST1090
GO TO 50 COST1100

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30	IF (KIND .NE. 43 .AND. KIND .NE. 44) GO TO 40	COST1110
	CALL PNRCST	COST1120
	IF (KIND .EQ. 43) CALL PEBNST	COST1130
	GO TO 50	COST1140
40	IF (KIND .NE. 50 .AND. KIND .NE. 53) GO TO 50	COST1150
	CALL PTJNST	COST1160
	IF (KIND .EQ. 53) CALL PEBNST	COST1170
50	CONTINUE	COST1180
	CPSINT = (CPFU - PROFPR) * 0.15 / 1.15	COST1190
	CPFU = CPFU + CERFU	COST1200
	CRPS = CRPS + CERPD	COST1210
	CPTOT = CPAFI + CPFU + CGFU + CCFU + CWHFU	COST1220
	CRTOT = CRAFI + CRPS + CGRD + CCRD + CWHR	COST1230
	CTOT = CPTOT + CRTOT	COST1240
	COMP(1)=CPAFI	COST1250
	COMP(2)=CPFU	COST1260
	COMP(3)=CGFU	COST1270
	COMP(4)=CCFU	COST1280
	COMP(5)=CWHFU	COST1290
	COMP(6)=CRAFI	COST1300
	COMP(7)=CRPS	COST1310
	COMP(8)=CGRD	COST1320
	COMP(9)=CCRD	COST1330
	COMP(10)=CWHR	COST1340
	NTEN = 10	COST1350
	NKIND = MOD(KIND,NTEN)	COST1360
	IF (ICOST .EQ. 0) GO TO 9876	COST1370
	WRITE(6,5111) NCONF	COST1380
5111	FORMAT(// 8X, 13HCONFIGURATION, 15)	COST1390
	WRITE(6,4210) IYEAR	COST1400
4210	FORMAT(///23X23HRELATIVE COST SUMMARY /	COST1410
1	16X22H(COSTS IN THOUSANDS OF , 15, 1X8HDOLLARS) /)	COST1420
	WRITE(6,4212) CRTOT,CRAFI,CRPS,CGRD,CCRD,CWHR	COST1430
4212	FORMAT(/ 8X25HMISSILE DEVELOPMENT COSTS, F35.2 /	COST1440
1	19X22HAIRFRAME + INTEGRATION , F14.2 / 19X17HPROPULSION SYSTEM	COST1450
2	, F19.2 / 19X15HGUIDANCE SYSTEM, F21.2/ 19X15HCONTRCLS SYSTEM,	COST1460
3	F21.2 / 19X7HWARHEAD, F29.2)	COST1470
	WRITE(6,4214) CPTOT,CPAFI,CPFU,CGFU,CCFU,CWHFU	COST1480
4214	FORMAT(8X35HMISSILE FIRST UNIT PRODUCTION COSTS , F25.2 /	COST1490
1	19X22HAIRFRAME + INTEGRATION, F14.2/ 19X17HPROPULSION SYSTEM ,	COST1500
2	F19.2 / 19X15HGUIDANCE SYSTEM, F21.2/ 19X15HCONTRCLS SYSTEM ,	COST1510
3	F21.2 / 19X7HWARHEAD, F29.2)	COST1520
	WRITE(6,4216) CTOT	COST1530
4216	FORMAT(8X40HTOTAL COST THROUGH FIRST UNIT PRODUCTION , F20.2)	COST1540
	IF (ICOST .LE. 0) GO TO 9876	COST1550
	CALL PAGE	COST1560
	WRITE (6,5111) NCONF	COST1570
	WRITE(6,5210) IYEAR	COST1580
5210	FORMAT(15X37HRELATIVE COST BREAKDOWN - DEVELOPMENT /	COST1590
1	16X22H(COSTS IN THOUSANDS OF , 15, 1X8HDOLLARS))	COST1600
	WRITE(6,5212) CRAFI,CRENG,CRDEV,CRFTO,CRTOOL,CRMFGI,CRMFGM,CROA,	COST1610
1	PRRAF	COST1620
5212	FORMAT(8X22HAIRFRAME + INTEGRATION , F37.2 /	COST1630
1	19X11HENGINEERING, F25.2 / 19X11HDEVELOPMENT, F25.2 /	COST1640
2	19X16HFLIGHT TEST OPS. , F20.2 / 19X7HTOOLING, F29.2 /	COST1650

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3 19X10HMFG. LABOR, F26.2 / 19X14HMFG. MATERIALS, F22.2 / COST1660
4 19X17HQUALITY ASSURANCE, F19.2 / 19X6HPROFIT, F30.2 ) COST1670
WRITE(6,5214) CRPS,CGRD,CCRD,CWHR,CRTOT COST1680
5214 FORMAT( 8X17HPROPULSION SYSTEM, F42.2 / COST1690
1 8X15HGUIDANCE SYSTEM, F44.2 / 8X15HCONTROLS SYSTEM, F44.2 / COST1700
2 8X7HWARHEAD, F52.2 / 8X5HTOTAL, F54.2 ) COST1710
WRITE(6,3110) IYEAR, CPAFI COST1720
3110 FORMAT( / 14X, 47HRELATIVE COST BREAKDOWN - FIRST UNIT PRODUCTION COST1730
1 / 19X, 22HCOSTS IN THOUSANDS OF ,15, 1X, 8HDCOLLARS) / COST1740
2 8X24HAIRFRAME AND INTEGRATION , F35.2 ) COST1750
WRITE(6,3111) CPENG, CPTOOL, CPMFGL, CPMFGM, CPQA, PRFUAF COST1760
3111 FORMAT( 19X11HENGINEERING, F25.2 / 19X7HTOOLING, F29.2 / COST1770
1 19X10HMFG. LABOR , F26.2 / 19X14HMFG. MATERIALS , F22.2 / COST1780
2 19X17HQUALITY ASSURANCE , F19.2 / 19X6HPROFIT , F30.2 ) COST1790
WRITE(6,3120) CGFU, CCFU, CWHFU, CPFU COST1800
3120 FORMAT( 8X15HGLIDANCE SYSTEM , F45.2 / 8X15HCONTROLS SYSTEM , COST1810
1 F45.2 / 8X7HWARHEAD , F53.2 / 8X17HPROPULSION SYSTEM , F43.2) COST1820
IF( NKIND.EQ. 3 ) WRITE(6,3130) CEBFU COST1830
3130 FORMAT( 13X16HEXTERNAL BOOSTER , F31.2 ) COST1840
IF( NKIND.EQ. 3 ) WRITE(6,3140) CTCB, CLIB, CNOZB, CPRB, CPLB, CIGNE, COST1850
1 CSAR, PROFFX COST1860
3140 FORMAT( 19X4HCASE, F32.2 / 19X10HINSULATION, F26.2 / COST1870
1 19X6HNOZZLE, F30.2 / 19X10HPROPELLANT, F26.2 / COST1880
2 19X13HPROP. LOADING , F23.2 / 19X7HIGNITER, F29.2 / COST1890
3 19X10HSAFE + ARM, F26.2 / 19X6HPROFIT, F30.2 ) COST1900
IF( KIND .LT. 20 ) WRITE(6,3150) CSRFU COST1910
3150 FORMAT( 13X22HSOLID ROCKET SUSTAINER , F25.2 ) COST1920
IF( KIND .LT. 20 ) WRITE(6,3140) CCASE, CLI, CNOZ, CPRC, COST1930
1 CPLC, CIGN, CSA, PROFPR COST1940
IF( (KIND.LT.30).AND.(KIND.GE.20) ) WRITE(6,3160) CLRFU, CTC, CTP, COST1950
1 CM, CPS, CT, CP, CPL, CSA, PROFPR COST1960
3160 FORMAT( 13X23HLIQUID ROCKET SUSTAINER , F24.2 / COST1970
1 19X14HTHRUST CHAMBER , F22.2 / 19X9HTURBOPUMP , F27.2 / COST1980
2 19X15HMISC. EQUIPMENT , F21.2 / 19X21HPRESSURIZATION SYSTEM , COST1990
3 F15.2 / 19X7HTANKAGE , F29.2 / 19X7HFUEL/OX , F29.2 / COST2000
4 19X13HPROP. LOADING , F23.2 / 19X10HSAFE + ARM , F26.2 / COST2010
5 19X6HPROFIT , F30.2 ) COST2020
IF( KIND .GE. 50 ) WRITE(6,3170) CTJFU, CETJ, CT, CTJLF, CTJLFL, PROFPR COST2030
3170 FORMAT( 13X18HTURBOJET SUSTAINER , F29.2 / 19X6HENGINE, F30.2 / COST2040
1 19X7HTANKAGE , F29.2 / 19X4HFUEL, F32.2 / 19X13HFUEL LOADING , COST2050
2 F23.2 / 19X6HPROFIT, F30.2 ) COST2060
IPOUT=0 COST2070
IF( (KIND.GE.40) .AND. (KIND.LT.50) ) IPOUT=1 COST2080
IF( KIND.EQ.41 ) IPOUT=IPOUT + 1 COST2090
IF( IPOUT.EQ.1 ) WRITE(6,3210) CNRJFU COST2100
3210 FORMAT( 13X25HNON-INT. RAMJET SUSTAINER , F22.2 ) COST2110
IF( IPOUT.EQ.2 ) WRITE(6,3230) CIRJFU COST2120
3230 FORMAT( 13X25HINTEGRAL RAMJET SUSTAINER, F22.2 ) COST2130
IF( IPOUT.GT.0 ) WRITE(6,3211) CT, CEXIN, CPS, CLF, CLFL COST2140
3211 FORMAT( 19X7HTANKAGE , F29.2 / 19X15HEXT. INSULATION, F21.2 / COST2150
1 19X21HPRESSURIZATION SYSTEM , F15.2 / 19X4HFUEL, F32.2 / COST2160
2 19X12HFUEL LOADING , F24.2 ) COST2170
IF( IPOUT.EQ.1 ) WRITE(6,3220) CRJC, CCOML, CCOMM, CCOMI, CNCZ, PROFPR COST2180
3220 FORMAT( 19X9HCOMBUSTOR, F27.2 / 22X5HLABOR, F16.2 / COST2190
1 22X8H MATERIAL, F13.2 / 22X10HINSULATION, F11.2 / COST2200

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2	22X6HNOZZLE,F15.2 / 19X6HPROFIT,F30.2)	COST2210
	IF(1POUT.EQ.2) WRITE(6,3240) CBNOC,CBLC,CBMC,CLI,CNCZ,CPRC,	COST2220
1	CPLC,CIGN,CSA,PROFPR	COST2230
3240	FORMAT(19X17HBOOSTER/COMBUSTOR,F19.2 / 22X10HCASE LABCR,F11.2 /	COST2240
1	22X10HCASE MATL.,F11.2 / 22X10HCASE INSUL,F11.2 /	COST2250
2	22X6HNOZZLE,F15.2 / 22X9HBOO. PROP,F12.2/ 22X11HB. P. LOAD. ,	COST2260
3	F10.2 / 22X7HIGNITER,F14.2 / 22X10HSAFE + ARM, F11.2 /	COST2270
4	19X6HPROFIT, F30.2)	COST2280
	WRITE(6,3366) CPSINT	COST2290
3366	FORMAT(19X11HINTEGRATION , F25.2)	COST2300
9876	CONTINUE	COST2310
	QA = QASAV	COST2320
	S = SSAV	COST2330
	RETURN	COST2340
	END	COST2350

	SUBROUTINE AAICST(ASUPLD,TEMP8,IND1)	AAIC0010
C		AAIC0020
C	AIRFRAME AND INTEGRATION COST	AAIC0030
C		AAIC0040
	REAL NCZWT,MP	AAIC0050
	COMMON /COMVLS/ WTANK,VFXIN,VREQ,GGW,HPPUMP,WTFUEL,WCCMM,VCCMI,	AAIC0060
	1 R5,Y1,WNO7,KFM,MATTK,A,DCOM,WMC,VBI,DTHRT,RNOZI,NCZWT,MP,CASEM,	AAIC0070
	2 FNET,WT,WF,FMAX,S,T4,METTJ,ZXNB,D,WM,FC,PPEAK,RSP,NCET,QA,WCS,	AAIC0080
	3 WWW,WTC,WTP,WGG,WSC,WLV,VT,WC,WP,DP,WN,METAL,NCCNFG	AAIC0090
	COMMON /COSTIN/ PRIA1,PRIA2,PRJC,PRIA3,PRIB3,PRIA4,PRIF4,PRIA5,	AAIC0100
	1PRIA6,PRIA7,PRIA8,PRIB8,PRIA9,PRIG9,PRIA10,PRIA11,PRIG11,PRIA12,	AAIC0110
	2PRIB12,PRIE12,PRIA13,PRIE13,PRIA14,PRIE14,PRIA15,PRIF15,PRIA16,	AAIC0120
	3PRIE16,PRIA17,PRIF17,PRIA18,PRIB18,PRIE18,PRIA19,PRIE19,PRIA20,	AAIC0130
	4PRIA21,PRIA22,PRIB22,PRIA23,PRIB23,PRIC23,PRIA24,PRIC24,PRIA25,	AAIC0140
	5PRIB25,PRIA26,PRIB26,PRIC26,PRNA1,PRNA2,PRNA3,PRNB3,PRNA4,PRNE4,	AAIC0150
	6PRNA5,PRNA6,PRNA7,PRNA8,PRNB8,PRNA9,PRNG9,PRNA10,PRNA11,PRNG11,	AAIC0160
	7PRNA12,PRNB12,PRNE12,PRNA13,PRNE13,PRNA14,PRNE14,PRNA15,PRNA16,	AAIC0170
	8PRNA17,PRNA18,PRNB18,PRNA19,PRNB19,PRNC19,PRNA20,PRNC20,PRNA21,	AAIC0180
	9PRNB21,PRNA22,PRNB22,PRNC22,PLPC,PLA1,PLA3,PLB3,PLA4,PLA6,PLA8,	AAIC0190
	4PLB8,PLA9,PLA11,PLB11,PLA13,PLB13,PLC13,PLD13,PLA14,PLD14,PLA15,	AAIC0200
	4PLB15,PLE15,PLF15,PLA16,PLE16,PLA17,PLA18,PLB18,PLC18,PLA19,PLA20,	AAIC0210
	4PLB20,PLA21,PLB21,PLC21,PTA1,PTD1,PTA4,PTB4,PTA5,PTB5,PTC5,PTA6,	AAIC0220
	4PTC6,PTA7,PTB7,PTC7,PTJC,PTA8,PTD8,PTA9,PTB9,PTA10,PTB10,PTC10,	AAIC0230
	4PEFA3,PEB3,PEA4,PEE4,PEA5,PEF5,PEA6,PEB6,PEE6,PEA7,PEE7,PEA8,PEA9,	AAIC0240
	4PEFA10,PEB10,PEC10,PEA11,PEB11,PEE11,PEBC,PSPC,PSA3,PSB3,PSA4,PSE4,	AAIC0250
	4GPSA5,PSF5,PSA6,PSF6,PSG6,PSA7,PSF7,PSA8,PSA9,PSA10,PSB10,PSC10,	AAIC0260
	4HPSA11,PSB11,PSE11,CFT,PFT,CFCASE,PFCASE,CFC,PFC,CFM,PFM,IYEAR	AAIC0270
	COMMON /COSTIN/ PRIB1,PRIC1,PRIB2,PRIC2,PRIB4,PRIC4,PRID4,PRIF5,	AAIC0280
	1PRIC5,PRIB9,PRIC9,PRID9,PRIF9,PRIF9,PRIB11,PRIC11,PRID11,PRIF11,	AAIC0290
	2PRIF11,PRIC12,PRID12,PRIB13,PRIC13,PRID13,PRIB14,PRIC14,PRID14,	AAIC0300
	3PRIB15,PRIC15,PRID15,PRIB16,PRIC16,PRID16,PRIB17,PRIC17,PRID17,	AAIC0310
	4PRIE17,PRIC18,PRID18,PRIB19,PRIC19,PRID19,PRIB24,PRNB1,PRNC1,PRNP2	AAIC0320
	5,PRNC2,PRNB4,PRNC4,PRND4,PRNB5,PRNC5,PRNB9,PRNC9,PRNC9,PRNE9,PRNF9	AAIC0330
	6,PRNB11,PRNC11,PRND11,PRNE11,PRNF11,PRNC12,PRND12,PRNB13,PRNC13,	AAIC0340
	7PRND13,PRNB14,PRNC14,PRND14,PRNB15,PRNC15,PRND15,PRNE16,PRNC16,	AAIC0350
	8PRND16,PRNB17,PRNC17,PRND17,PRNE17,PRNB20,PLB1,PLC1,PLA2,PLB2,PLB4	AAIC0360
	9,PLC4,PLA5,PLB5,PLB6,PLC6,PLA7,PLB7,PLB9,PLC9,PLA10,PLB10,PLA12,	AAIC0370


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APL B12,PLB14,PLC14,PLC15,PLD15,PLB16,PLC16,PLD16,PLB19,PLC19,PTB1, AAIC0380
BPTC1,PTA2,PTB2,PTA3,PTB3,PTC5,PTD5,PTB6,PTC6,PTD6,PTB8,PTC8,PEA1, AAIC0390
CPEB1,PEC1,PEA2,PER2,PEC2,PEB4,PEC4,PED4,PEB5,PEC5,PEE5,PEC6, AAIC0400
DPED6,PER7,PEC7,PED7,PEC11,PED11,PSA1,PSB1,PSC1,PSA2,PSB2,PSC2,PSB4,AAIC0410
E,PSC4,PSD4,PSB5,PSC5,PSD5,PSE5,PSB6,PSC6,PSD6,PSE6,PSB7,PSC7,PSD7,AAIC0420
FPSF7,PSC11,PSD11,PRND22,PLD21,PLE21,PTD10,PTE10,PRID26 AAIC0430
COMMON /CONSTIN/ PROFIT,QD,R,AFA1,AFB1,AFC1,AFD1,AFI1,AFA2,AFR2, AAIC0440
1AFG2,AFA3,AFB3,AFG3,AFA4,AFB4,AFC4,AFD4,AFJ4,AFA5,AFB5,AFC5,AFH5, AAIC0450
2AFA6,AFB6,AFG6,AFA7,AFC7,AFD7,AFA8,AFB8,AFC8,AFD8,AFI8,AFA9,AFB9, AAIC0460
3AFC9,AFI9,AFJ9,AFA10,AFB10,AFC10,AFH10,AFA11,AFB11,AFI11,AFI12, AAIC0470
4AFC12,AFD12,AFI13,AFA13,AFC13,AFA14,AFB14,AFC14,KFUZE,WA1,WF1,WF1, AAIC0480
5WA2,WD2,WF2,KGAIN,CA1,CE1,CF1,CA2,CE2,CF2,CA3,CE3,CF3,GA1,GB1,GF1,AAIC0490
6KLF6,KGT6,KSTAB,KAGATE,NCHAN,KSGATE,GA2,GB2,GK2,GA3,GB3,GQ3,GA4, AAIC0500
7CR4,CM4,GA5,GR5,GH5,KG,KC,KW,KA,KP,IGTYPE,ICTYPE,I PRCT AAIC0510
COMMON /CONSTIN/ AFE1,AFF1,AFG1,AFH1,AFC2,AFD2,AFF2,AFF2,AFC3, AAIC0520
1AFD3,AFF3,AFF3,AFF4,AFF4,AFG4,AFH4,AFI4,AFD5,AFF5,AFF5,AFG5,AFC6, AAIC0530
2AFD6,AFF6,AFF6,AFB7,AFF7,AFF8,AFG8,AFH8,AFF9,AFF9,AFG9,AFH9,AFI9, AAIC0540
3AFD10,AFF10,AFF10,AFC10,AFC10,AFC11,AFF11,AFB12,WB1,WB1,WB1,AAIC0550
4WR2,WC2,CR1,CC1,CD1,CB2,CC2,CD2,CB3,CC3,CD3,GC1,GD1,GE1,GC2,GD2, AAIC0560
5GE2,CF2,GG2,GH2,GI2,GJ2,GC3,GD3,GE3,GF3,GG3,GH3,GI3,GJ3,GK3,GL3, AAIC0570
6CM3,GN3,GP3,GC4,CD4,GE4,GF4,GG4,GH4,GI4,GJ4,GK4,GL4,GC5,GD5,GE5, AAIC0580
7CF5,GG5,CFTTAB(11),PFTTAB(11) AAIC0590
COMMON /CSTPRV/ CBLC,CBMC,CCASE,CCFU,CCL,CCM,CCOMI,CCOML,CCOMM, AAIC0600
1 CCONT,CCRD,CBFCU,CBRD,CETJ,CEXIN,CGFU,CGRD, AAIC0610
2 CGT,CGTOT,CIGN,CIRJFU, CIRJRD, CLF,CLFL,CLGG,CLI,CLM, AAIC0620
3 CLRFE,CLRRD,CLRT,CLTC,CLTP,CM,CMGG,CMW,CMT,C,CMTP, AAIC0630
4 CMV,CNDZ,CNRJFU, CNRJR, CP,CPAFI,CPENG,CPL,CPLC, AAIC0640
5 CPMFGL,CPMFGM,CPQA,CPR,CPRC,CPS,CPMGG,CPSN2,CPSRAM,CPSSGG, AAIC0650
6 CPTOOL,CRAFI,CRDEV,CREG,CRENG,CRFTO,CRJC,CRMFGI,CRMFGM,CRQA, AAIC0660
7 CRTOOL,CSA,CSRFE,CSRRO,CSRT,CT,CTAFI,CTC,CTEB,CTIRJ,CTJFU, AAIC0670
8 CTJLF,CTJLFL,CTJRD,CTJT, CTL,CTM,CTNRJ,CTP,CWH,CWHFU,CWHR, AAIC0680
9 CBOOC,CRPS,CPEFU,PROFPR,PRFUAF,PRRAF,CCLB,CCMB,CTCB,CLIB,CNDZB, AAIC0690
A CPRB,CPLB,CIGNB,CSAB,PROFEX AAIC0700
NAMFLIST /FRRPRT/ CRENG,CRDEV,CRFTO,CRTOOL,CRMFGI,CRMFGM,CRQA, AAIC0710
1 CRAFI,CPENG,CPTOOL,CPMFGI,CPMFGM,CPQA,CPAFI,CTAFI AAIC0720
1 TEMP1=AFA1*AFB1*AFC1*AFD1*(AFE1*ASUPLD**AFF1*S**AFG1*QD**AFH1 AAIC0730
1 /1000.)*AFI1*AFD1 AAIC0740
2 TEMP2=AFA2*AFB2*1.163*(AFC2*ASUPLD**AFD2*S**AFE2*QD**AFF2/1000.) AAIC0750
1 +AFB2*AFG2 AAIC0760
3 TEMP3=AFA3*AFB3*1.163*(AFC3*ASUPLD**AFD3*S**AFE3*QD**AFF3/1000.) AAIC0770
1 +AFB3*AFG3 AAIC0780
4 TEMP4=AFA4*AFB4*AFC4*AFD4*(AFE4*ASUPLD**AFF4*S**AFG4*QD**AFH4*R AAIC0790
1 **AFI4/1000.)*AFJ4*AFC4 AAIC0800
5 TEMP5=AFA5*AFB5*AFC5*(AFD5*ASUPLD**AFE5*S**AFF5*QD**AFG5/1000.) AAIC0810
1 +AFC5*AFH5 AAIC0820
6 TEMP6=AFA6*AFB6*1.163*(AFC6*ASUPLD**AFD6*S**AFE6*QD**AFF6/1000.) AAIC0830
1 +AFB6*AFG6 AAIC0840
7 TEMP7=AFA7*AFB7*TEMP5+AFC7*AFD7 AAIC0850
14 TEMP8=AFA14*(1.+PROFIT)*(TEMP1+TEMP4+TEMP5+TEMP6+TEMP7+TEMP2 AAIC0860
1 +TEMP3)+AFB14*AFC14 AAIC0870
IF (INDI.EQ.0) RETURN AAIC0880
CRENG=TEMP1 AAIC0890
CRDEV=TEMP2 AAIC0900
CRFTO=TEMP3 AAIC0910
CARTOOL=TEMP4 AAIC0920

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	CRMEGL=TEMP5	AAIC0930
	CRMEGM=TEMP6	AAIC0940
	CRQA=TEMP7	AAIC0950
	CRAFI=TEMP8	AAIC0960
	PRRAF=(CRAFI-APB14*AFB14)*PROFIT/(1.+PROFIT)	AAIC0970
8	CPENG=APB8*AFB8*AFB8*AFD8*(AFE8*AFB8*AFB8*AFG8*((QD+1.)*AFB8	AAIC0980
	1 -QD**AFB8)/1000.)*AFB8*AFD8	AAIC0990
9	CPTOOL=APB9*AFB9*AFB9*AFD9*(AFE9*AFB9*AFB9*AFG9*((QD+1.)*AFB9	AAIC1000
	1 -QD**AFB9)*R**AFB9/1000.)*AFB9*AFD9	AAIC1010
10	CPMEGL=APB10*AFB10*AFB10*AFD10*(AFE10*AFB10*AFB10*AFG10*((QD+1.)*AFB10	AAIC1020
	1 -QD**AFB10)/1000.)*AFB10*AFD10	AAIC1030
11	CPMEGM=APB11*AFB11*1.163*(AFB11*AFB11*AFD11*AFB11*((QD+1.)*AFB11	AAIC1040
	1 -QD**AFB11)/1000.)*AFB11*AFD11	AAIC1050
12	CPQA=APB12*AFB12*CPMEGL+AFB12*AFD12	AAIC1060
13	CPAFI=APB13*(1.+PROFIT)*(CPENG+CPTOOL+CPMEGL+CPMEGM+CPQA)	AAIC1070
	1 +AFB13*AFB13	AAIC1080
	PRFUA=(CPAFI-APB13*AFB13)*PROFIT/(1.+PROFIT)	AAIC1090
15	CTAFI=CPAFI+CRAFI	AAIC1100
	IF (IPRST.NE.0) WRITE (6,ERRPRT)	AAIC1110
	RETURN	AAIC1120
	END	AAIC1130

	SUBROUTINE GUCOST	GUC00010
		GUC00020
	GUIDANCE SYSTEM COST	GUC00030
		GUC00040
	REAL NOZWT,MP	GUC00050
	COMMON /COMVLS/ WTANK,VEXIN,VREQ,GGW,HPPUMP,WTFUEL,WCCMM,VCCMT,	GUC00060
1	RS,Y1,WNOZ,KFM,MATTK,A,DCOM,WMC,VBI,DTHRT,RNOZI,NCZWT,MP,CASEM,	GUC00070
2	FNET,WT,WF,FMAX,S,T4,METTJ,ZXNB,D,WM,FC,PPEAK,BSP,NDT,QA,WCS,	GUC00080
3	WWH,WTC,WTP,WGG,WSC,WLV,VGT,WO,WP,DP,WN,METAL,NCONF	GUC00090
	COMMON /COSTIN/ PRIA1,PRIA2,PRJC,PRIA3,PRIB3,PRIA4,PRIE4,PRIA5,	GUC00100
1	PRIA6,PRIA7,PRIA8,PRIB8,PRIA9,PRIG9,PRIA10,PRIA11,PRIG11,PRIA12,	GUC00110
2	PRIB12,PRIE12,PRIA13,PRIE13,PRIA14,PRIE14,PRIA15,PRIE15,PRIA16,	GUC00120
3	PRIF16,PRIA17,PRIF17,PRIA18,PRIB18,PRIE18,PRIA19,PRIE19,PRIA20,	GUC00130
4	PRIA21,PRIA22,PRIB22,PRIA23,PRIB23,PRIC23,PRIA24,PRIC24,PRIA25,	GUC00140
5	PRIB25,PRIA26,PRIB26,PRIC26,PRNA1,PRNA2,PRNA3,PRNB3,PRNA4,PRNF4,	GUC00150
6	PRNA5,PRNA6,PRNA7,PRNA8,PRNB8,PRNA9,PRNG9,PRNA10,PRNA11,PRNG11,	GUC00160
7	PRNA12,PRNB12,PRNE12,PRNA13,PRNE13,PRNA14,PRNE14,PRNA15,PRNA16,	GUC00170
8	PRNA17,PRNA18,PRNB18,PRNA19,PRNB19,PRNC19,PRNA20,PRAC20,PRNA21,	GUC00180
9	PRNB21,PRNA22,PRNB22,PRNC22,PLPC,PLA1,PLA3,PLB3,PLA4,PLA6,PLA8,	GUC00190
	APLB8,PLA9,PLA11,PLB11,PLA13,PLB13,PLC13,PLD13,PLA14,PLD14,PLA15,	GUC00200
	BPLB15,PLE15,PLF15,PLA16,PLE16,PLA17,PLA18,PLB18,PLC18,PLA19,PLA20,	GUC00210
	CPLB20,PLA21,PLB21,PLC21,PTA1,PTD1,PTA4,PTB4,PTA5,PTP5,PTP5,PTA6,	GUC00220
	DPTE6,PTA7,PTB7,PTC7,PTJC,PTA8,PTD8,PTA9,PTB9,PTA10,PTB10,PTC10,	GUC00230
	EPEA3,PEP3,PEA4,PEF4,PEA5,PEF5,PEA6,PEB6,PEE6,PEA7,PEF7,PEA8,PEA9,	GUC00240
	FPEA10,PEB10,PEC10,PEA11,PEB11,PEF11,PEBC,PSPC,PSA3,PSB3,PSA4,PEE4,	GUC00250
	GPSA5,PSF5,PSA6,PSF6,PSG6,PSA7,PSF7,PSA8,PSA9,PSA10,PSF10,PSF10,	GUC00260
	HPSA11,PSB11,PSF11,CFT,PFT,CFCASE,PFCEASE,CFC,PFCE,CFM,PFM,IYEAR	GUC00270
	COMMON /COSTIN/ PRIB1,PRIC1,PRIB2,PRIC2,PRIB4,PRIC4,PRID4,PRIB5,	GUC00280
1	PRIC5,PRIB9,PRIC9,PRID9,PRIE9,PRIF9,PRIB11,PRIC11,PRID11,PRIE11,	GUC00290
2	PRIF11,PRIC12,PRID12,PRIB13,PRIC13,PRID13,PRIB14,PRIC14,PRID14,	GUC00300
3	PRIB15,PRIC15,PRID15,PRIB16,PRIC16,PRID16,PRIB17,PRIC17,PRID17.	GUC00310

4PRIE17,PRIC18,PRID18,PRIB19,PRIC15,PRID19,PRIB24,PRNB1,PRNC1,PRAB2GUC00320
5,PRNC2,PRNB4,PRNC4,PRND4,PRNB5,PRNC5,PRNB9,PRNC9,PRAD9,PRNE9,PRNF9GUC00330
6,PRNB11,PRNC11,PRND11,PRNE11,PRNF11,PRNC12,PRND12,PRNB13,PRNC13, GUC00340
7PRND13,PRNB14,PRNC14,PRND14,PRNB15,PRNC15,PRND15,PRNB16,PRNC16, GUC00350
8PPND16,PRNB17,PRNC17,PRND17,PRNE17,PRNB20,PLB1,PLC1,PLA2,PLB2,PLB4GUC00360
9,PLC4,PLA5,PLB5,PLB6,PLC6,PLA7,PLB7,PLB9,PLC9,PLA10,PLB10,PLA12, GUC00370
APLB12,PLB14,PLC14,PLC15,PLD15,PLB16,PLC16,PLD16,PLB19,PLC19,PTB1, GUC00380
RPTC1,PTA2,PTB2,PTA3,PTB3,PTC5,PTD5,PTB6,PTC6,PTD6,PTB8,PTC8,PEA1, GUC00390
CPEB1,PEC1,PEA2,PEB2,PEC2,PEB4,PEC4,PED4,PEB5,PEC5,PED5,PEE5,PEC6, GUC00400
DPED6,PEB7,PEC7,PED7,PEC11,PED11,PSA1,PSB1,PSC1,PSA2,PSB2,PSC2,PSB4GUC00410
E,PSC4,PSD4,PSB5,PSC5,PSD5,PSE5,PSB6,PSC6,PSD6,PSE6,PSB7,PSC7,PSD7,GUC00420
FPSE7,PSC11,PSD11,PRND22,PLD21,PLE21,PTD10,PTD10,PRID26 GUC00430

COMMON /COSTIN/ PROFIT,QD,R,AF1,AFB1,AFD1,AFI1,AFJ1,AFK1,AFB2, GUC00440
1AFG2,AFB3,AFB3,AFG3,AFB4,AFB4,AFB4,AFJ4,AFJ4,AFB5,AFB5,AFB5,AFB5, GUC00450
2AFA6,AFB6,AFG6,AFB7,AFB7,AFB7,AFB8,AFB8,AFB8,AFB8,AFB8,AFB8,AFB8, GUC00460
3AFC9,AFD9,AFJ9,AFB10,AFB10,AFB10,AFB10,AFB10,AFB10,AFB10,AFB10, GUC00470
4AFC12,AFD12,AFB13,AFB13,AFB13,AFB13,AFB13,AFB13,AFB13,AFB13,AFB13, GUC00480
5WA2,WC2,WE2,KGA1N,CA1,CE1,CF1,CA2,CE2,CF2,CA3,CE3,CF3,GA1,GB1,GF1,GUC00490
6KLE6,KGT6,KSTAB,KAGATE,NCHAN,KSGATE,GA2,GB2,GK2,GA3,GB3,GQ3,GA4, GUC00500
7GB4,GM4,GA5,GB5,GH5,KG,KC,KW,KA,KP,IGTYPE,ICTYPE,IPRST GUC00510
COMMON /COSTIN/ AFF1,AFF1,AFG1,AFH1,AFD2,AFD2,AFE2,AFF2,AFB3, GUC00520
1AFD3,AFF3,AFF3,AFF4,AFF4,AFG4,AFH4,AFI4,AFD5,AFF5,AFF5,AFG5,AFB6, GUC00530
2AFD6,AFF6,AFF6,AFB7,AFF8,AFB8,AFB8,AFB8,AFB8,AFB8,AFB8,AFB8,AFB8, GUC00540
3AFD10,AFF10,AFF10,AFG10,AFB11,AFD11,AFF11,AFF11,AFB12,WB1,WC1,WD1, GUC00550
4WP2,WC2,CB1,CC1,CD1,CR2,CC2,CD2,CB3,CC3,CD3,GC1,GD1,GE1,GC2,GD2, GUC00560
5CE2,CF2,GG2,GH2,GI2,GJ2,GC3,GD3,GE3,GF3,GG3,GH3,GI3,GJ3,GK3,GL3, GUC00570
6GM3,GN3,CP3,GC4,GD4,GE4,GF4,GG4,GH4,GI4,GJ4,GK4,GL4,GC5,GD5,GE5, GUC00580
7CF5,GG5,CFTTAB(11),PFTTAB(11) GUC00590

COMMON /CSTPRV/ CBLC,CBMC,CCASE,CCFU,CCL,CCM,CCOMI,CCOML,CCOMM, GUC00600
1 CCONT,CCRD,CBFCU,CBFRD,CETJ,CEXIN,CGFU,CGRD, GUC00610
2 COT,CGTOT,CIGN,CIRJFU, CIRJRD, CLF,CLFL,CLGG,CLI,CLM, GUC00620
3 CLRFD,CLRRD,CLRT,CLTC,CLTP,CM,CMGG,CMM,CMT,CMT, GUC00630
4 CMV,CNOZ,CNRJFU, CNRJR, CP,CPAFI,CPENG,CPL,CPLC, GUC00640
5 CPMFGL,CPMFGM,CPOA,CPR,CPRC,CPS,CPSMGG,CPSN2,CPSRAM,CPSSGG, GUC00650
6 CPTOOL,CRAFI,CRDEV,CREG,CRENG,CRTD,CRJC,CRMFGM,CRMFGM,CRQA, GUC00660
7 CRTOOL,CSA,CSRFD,CSRFD,CSRT,CT,CTAFI,CTC,CTEB,CTIRJ,CTJFU, GUC00670
8 CTJLF,CTJLFL,CTJRD,CTJT, CTL,CTM,CTNRJ,CTP,CWH,CWHEU,CWHR, GUC00680
9 CROOC,CRPS,CPU,PROFPR,PRUFAR,PRRAF,CCLB,CCMB,CTCB,CLIB,CNCZR, GUC00690
A CPRB,CPLB,CIGNB,CSAB,PROFEX GUC00700

NAMLIST /ERRPR/ CGFUP,CGFUA,CGFUX,CGFUI,CGRD,CGTOT GUC00710
XDET=NDET GUC00720
XSTAB=KSTAB GUC00730
XAGATE=KAGATE GUC00740
XCHAN=NCHAN GUC00750
XSGATE=KSGATE GUC00760
XKLE6=1. GUC00770
XKGT6=0. GUC00780

C FC IS ASSUMED IN GHZ GUC00790
IF (FC .LE. 6.) GO TO 1000 GUC00800
XKLE6=0. GUC00810
XKGT6=1. GUC00820
1000 IF (IGTYPE .EQ. 3) GO TO 1 GUC00830
GO TO (2,3,4,5),IGTYPE GUC00840
C PASSIVE/SEMI-ACTIVE RADAR SEEKER GUC00850
2 CX=GC2*XKLE6*FC**GD2+GE2*XKGT6*FC**GF2+GG2*XSTAB+GH2*XAGATE+GI2 GUC00860

1	*XCHAN*XSGATE+GJ2*XSGATE	GU000870
	CGFUP=CA2*(1.16*GB2*CX/350.+GK2)	GU000880
	GO TO 1	GU000890
C	ACTIVE RADAR (MAGNETRON)	GU000900
3	CX=GC3*XKLE6*FC**GD3+GF3*XKGT6*FC**GF3+GG3*XSTAR+GH3*XAGATE+GI3	GU000910
1	*XCHAN*XSGATE+GJ3*XSGATE	GU000920
	CGFUA=GA3*(1.566*GB3/350.*(CX+GK3+GL3*PPEAK**GM3+GA3*FC**GP3	GU000930
1	*PPEAK)+GQ3)	GU000940
	GO TO 1	GU000950
C	X BAND	GU000960
4	CX=GC4*XKLE6*FC**GD4+GF4*XKGT6*FC**GF4+GG4*XSTAR+GH4*XAGATE+GI4	GU000970
1	*XCHAN*XSGATE+GJ4*XSGATE	GU000980
	CGFUX=CA4*(1.566*GB4/156.*(CX+GK4+GL4*PPEAK)+GM4)	GU000990
	GO TO 1	GU001000
C	PASSIVE IR SEEKER	GU001010
5	CGFUI=CA5*(1.16*GB5/350.*(GC5*FC**GD5*BSP**GE5+GF5*(XDET-1.)	GU001020
1	+GG5)+GH5)	GU001030
1	IF (IGTYPE .EQ. 1) CGFU=CGFUP	GU001040
	IF (IGTYPE .EQ. 2) CGFU=CGFUA	GU001050
	IF (IGTYPE .EQ. 3) CGFU=CGFUX	GU001060
	IF (IGTYPE .EQ. 4) CGFU=CGFUI	GU001070
	CGRD=GA1*(GB1*(EXP(GC1+GD1*CGFU*GE1))+GF1)	GU001080
6	CGTOT=CGRD+CGFU	GU001090
	IF (IPRST .NE. 0) WRITE (6,ERRPRT)	GU001100
	RETURN	GU001110
	END	GU001120

	SUBROUTINE CTCOST	CT000010
C		CT000020
C	CONTROLS COST	CT000030
C		CT000040
	REAL NOZWT,MP	CT000050
	COMMON /COMVLS/ WTANK,VEXIN,VREQ,GGW,HPPUMP,WTFUEL,WCCMM,VCCMI,	CT000060
	1 R5,Y1,WNOZ,KFM,MATTK,A,DCOM,WMC,VBI,DTHRT,RNOZI,NC7WT,MP,CASEM,	CT000070
	2 FNET,WT,WF,FMAX,S,T4,METTJ,ZXNB,D,WM,FC,PPEAK,BSP,NDET,QA,WCS,	CT000080
	3 WWW,WTC,WTP,WGG,WSC,WLV,VT,WO,WP,DP,WN,METAL,NCCNFG	CT000090
	COMMON /COSTIN/ PRIA1,PRIA2,PRJC,PRIA3,PRIB3,PRIA4,PRIF4,PRIA5,	CT000100
	1PRIA6,PRIA7,PRIA8,PRIB8,PRIA9,PRIG9,PRIA10,PRIA11,PRIG11,PRIA12,	CT000110
	2PRIB12,PRIF12,PRIA13,PRIE13,PRIA14,PRIE14,PRIA15,PRIE15,PRIA16,	CT000120
	3PRIF16,PRIA17,PRIF17,PRIA18,PRIB18,PRIE18,PRIA19,PRIE19,PRIA20,	CT000130
	4PRIA21,PRIA22,PRIB22,PRIA23,PRIB23,PRIC23,PRIA24,PRIC24,PRIA25,	CT000140
	5PRIB25,PRIA26,PRIB26,PRIC26,PRNA1,PRNA2,PRNA3,PRNB3,PRNA4,PRNE4,	CT000150
	6PRNA5,PRNA6,PRNA7,PRNA8,PRNB8,PRNA9,PRNG9,PRNA10,PRNA11,PRNG11,	CT000160
	7PRNA12,PRNB12,PRNE12,PRNA13,PRNE13,PRNA14,PRNE14,PRNA15,PRNA16,	CT000170
	8PRNA17,PRNA18,PRNB18,PRNA19,PRNB19,PRNC19,PRNA20,PRNC20,PRNA21,	CT000180
	9PRNB21,PRNA22,PRNB22,PRNC22,PLPC,PLA1,PLA3,PLB3,PLA4,PLA6,PLA8,	CT000190
	APLB8,PLA9,PLA11,PLB11,PLA13,PLB13,PLC13,PLD13,PLA14,PLD14,PLA15,	CT000200
	BPLB15,PLE15,PLF15,PLA16,PLE16,PLA17,PLA18,PLB18,PLC18,PLA19,PLA20,	CT000210
	CPLB20,PLA21,PLR21,PLC21,PTA1,PTD1,PTA4,PTB4,PTA5,PTB5,PTF5,PTA6,	CT000220
	CPTE6,PTA7,PTB7,PTC7,PTJC,PTA8,PTD8,PTA9,PTB9,PTA10,PTB10,PTC10,	CT000230
	EPFA3,PEB3,PEA4,PEE4,PEA5,PEF5,PEA6,PEB6,PEE6,PEA7,PEE7,PEA8,PEA9,	CT000240
	FPEA10,PEB10,PEC10,PEA11,PEB11,PEE11,PEBC,PSPC,PSA3,PSB3,PSA4,PSF4,	CT000250
	GPSA5,PSF5,PSA6,PSF6,PSG6,PSA7,PSF7,PSA8,PSA9,PSA10,PSB10,PSC10,	CT000260

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HPSA11,PSR11,PSE11,CFT,PFT,CFCASE,PFCASE,CFC,PFC,CFM,PFM,IYEAR      CTC00270
COMMON /COSTIN/  PRIB1,PRIC1,PRIB2,PRIC2,PRIB4,PRIC4,PRID4,PRIP5,CTC00280
1PRIC5,PRIB9,PRIC9,PRID9,PRIE9,PRIF9,PRIB11,PRIC11,PRID11,PRIE11,    CTC00290
2PRIF11,PRIC12,PRID12,PRIB13,PRIC13,PRID13,PRIB14,PRIC14,PRID14,    CTC00300
3PRIB15,PRIC15,PRID15,PRIB16,PRIC16,PRID16,PRIB17,PRIC17,PRID17,    CTC00310
4PRIF17,PRIC18,PRID18,PRIB19,PRIC19,PRID19,PRIB24,PRNE1,PRNC1,PRNB2CTC00320
5,PRNC2,PRNB4,PRNC4,PRND4,PRNB5,PRNC5,PRNB9,PRNC9,PRND9,PRNE9,PRNF9CTC00330
6,PRNB11,PRNC11,PRND11,PRNE11,PRNF11,PRNC12,PRND12,PRNB13,PRNC13,    CTC00340
7PRND13,PRNB14,PRNC14,PRND14,PRNB15,PRNC15,PRND15,PRNB16,PRNC16,    CTC00350
8PRND16,PRNB17,PRNC17,PRND17,PRNE17,PRNB20,PLB1,PLC1,PLA2,PLB2,PLB4CTC00360
9,PLC4,PLA5,PLB5,PLB6,PLC6,PLA7,PLB7,PLB9,PLC9,PLA10,PLB10,PLA12,    CTC00370
APLB12,PLB14,PLC14,PLC15,PLD15,PLB16,PLC16,PLD16,PLB19,PLC19,PTB1,    CTC00380
BPTC1,PTA2,PTB2,PTA3,PTB3,PTC5,PTD5,PTB6,PTC6,PTD6,PTB8,PTC8,PEA1,    CTC00390
CPEB1,PEC1,PEA2,PEB2,PEC2,PEB4,PEC4,PED4,PEB5,PEC5,PEC5,PEE5,PEC6,    CTC00400
CPED6,PER7,PEC7,PEF7,PEC11,PED11,PSA1,PSB1,PSC1,PSA2,PSB2,PSC2,PSB4CTC00410
E,PSC4,PSD4,PSB5,PSC5,PSD5,PSE5,PSB6,PSC6,PSD6,PSE6,PSB7,PSC7,PSC7,CTC00420
FPSE7,PSC11,PSD11,PRND22,PLD21,PLE21,PTD10,PTE10,PRID26            CTC00430
COMMON /COSTIN/  PROFIT,QD,R,AFA1,AFB1,AFC1,AFD1,AFF1,AFA2,AFB2,    CTC00440
1AFG2,AFA3,AFB3,AFG3,AFA4,AFB4,AFC4,AFD4,AFJ4,AFA5,AFB5,AFC5,AFH5,    CTC00450
2AFA6,AFB6,AFG6,AFA7,AFC7,AFD7,AFA8,AFB8,AFC8,AFD8,AFI8,AFA9,AFB9,    CTC00460
3AFC9,AFD9,AFJ9,AFA10,AFB10,AFC10,AFH10,AFA11,AFB11,AFG11,AFA12,    CTC00470
4AFC12,AFD12,AFA13,AFB13,AFC13,AFA14,AFB14,AFC14,KFUZE,WA1,WE1,WF1,    CTC00480
5WA2,WD2,WE2,KGAIN,CA1,CE1,CF1,CA2,CE2,CF2,CA3,CE3,CF3,GA1,GB1,GF1,    CTC00490
6KLE6,KGT6,KSTAR,KAGATE,NCHAN,KSGATE,GA2,GB2,GK2,GA3,GB3,GQ3,GA4,    CTC00500
7GR4,CM4,GA5,GB5,GH5,KG,KC,KW,KA,KP,IGTYPE,ICTYPE,IPRST            CTC00510
COMMON /COSTIN/  AFE1,AFF1,AFG1,AFH1,AFC2,AFD2,AFF2,AFF2,AFC3,    CTC00520
1AFD3,AFF3,AFF3,AFF4,AFF4,AFG4,AFH4,AFF4,AFD5,AFF5,AFF5,AFG5,AFC6,    CTC00530
2AFD6,AFF6,AFF6,AFB7,AFF8,AFF8,AFG8,AFH8,AFF9,AFF9,AFG9,AFH9,AFF9,    CTC00540
3AFD10,AFF10,AFF10,AFG10,AFC11,AFD11,AFF11,AFF11,AFB12,WB1,WC1,WD1,    CTC00550
4W2,WC2,GB1,CC1,CD1,GB2,CC2,CD2,GB3,CC3,CD3,GC1,GD1,GF1,GC2,GD2,    CTC00560
5CE2,CF2,GG2,GH2,GI2,GJ2,GC3,GD3,GE3,GF3,GG3,GH3,GI3,GJ3,GK3,GL3,    CTC00570
6GM3,GN3,GP3,GC4,GD4,GE4,GF4,GG4,GH4,GI4,GJ4,GK4,GL4,GC5,GD5,GF5,    CTC00580
7GF5,GG5,CFTTAB(11),PFTTAB(11)    CTC00590
COMMON /CSTPRV/  CRLC,CBMC,CCASE,CCFU,CCL,CCM,CCOMI,CCOML,CCOMM,    CTC00600
1 CCONT,CCRD,CBFCU,CBFRD,CETJ,CEXIN,CGFU,CGRD,    CTC00610
2 CBT,CBTOT,CIGN,CIRJFU,    CIRJRD,    CLF,CLFL,CLGG,CLT,CLM,    CTC00620
3 CCLFU,CLRRD,CLRT,CLTC,CLTP,CM,CMGG,CMH,CMT,CMTP,    CTC00630
4 CMV,CNZ,CNRJFU,    CNRJRD,    CP,CPAFI,CPENG,CPL,CPLC,    CTC00640
5 CPMFGL,CPMEGM,CPOA,CPR,CPRC,CPS,CPSMGG,CPSN2,CPSRAM,CPSSGG,    CTC00650
6 CPTOOL,CRAFI,CRDEV,CREG,CRENG,CRTD,CRJC,CRMFG,CRMFGM,CROA,    CTC00660
7 CRTOOL,CSA,CSRFD,CSRT,CT,CTAFI,CTC,CTEB,CTIRJ,CTJFU,    CTC00670
8 CTJLF,CTJLFL,CTJRD,CTJT,    CTL,CTM,CTNRJ,CTP,CWH,CWHFU,CWHR,    CTC00680
9 CBOOC,CRPS,CPFU,PROFPR,PRUFAP,PRRAF,CCLB,CCMB,CTCB,CLIB,CNCZP,    CTC00690
A CPRB,CPLB,CIGNB,CSAB,PROFEX    CTC00700
NAMELIST /ERRPRT/ CCFU,CCRD,CCONT    CTC00710
XGAIN=KGAIN    CTC00720
GO TO (2,3),ICTYPE    CTC00730
C WITH AUTOPILOT    CTC00740
2 CCFU=CA2*(1.16*(CB2*WCS+CC2*QA-CD2))*CE2/198.+CF2)    CTC00750
GO TO 1    CTC00760
C WITHOUT AUTOPILOT    CTC00770
3 CCFU=CA3*(1.16*(CB3*WCS+CC3*QA+CD3))*CE3/198.+CF3)    CTC00780
1 CCRD=CA1*((CB1+CC1*QA+CD1)*XGAIN)*CE1+CF1)    CTC00790
4 CCONT=CCRD+CCFU    CTC00800
IF (IPRST.NE.C) WRITE (6,ERRPRT)    CTC00810

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RETURN
END

CTC00820
CTC00830

SUBROUTINE WHCOST

C
C
C

WARHEAD COST

REAL NCZWT,MP
COMMON /COMVLS/ WTANK,VFXIN,VREQ,GGW,HPPUMP,WTFUEL,WCOMM,VCCMI,
1 R5,Y1,WNOZ,KFM,WATTK,A,DCOM,WMC,VBI,DTHRT,RNOZI,NCZWT,MP,CASEM,
2 FNET,WT,WF,FMAX,S,T4,METITJ,ZXNB,D,WM,FC,PPEAK,RSP,NDET,QA,WCS,
3 WWW,WTC,WTP,WGG,WSC,WLV,VGT,WQ,WP,DP,WN,METAL,NCCAFG
COMMON /COSTIN/ PRIA1,PRIA2,PRJC,PRIA3,PRIE3,PRIA4,PRIE4,PRIA5,
1PRIA6,PRIA7,PRIA8,PRIB8,PRIA9,PRIG9,PRIA10,PRIA11,PRIG11,PRIA12,
2PRIB12,PRIE12,PRIA13,PRIE13,PRIA14,PRIE14,PRIA15,PRIE15,PRIA16,
3PRIE16,PRIA17,PRIF17,PRIA18,PRIB18,PRIE18,PRIA19,PRIE19,PRIA20,
4PRIA21,PRIA22,PRIB22,PRIA23,PRIB23,PRIC23,PRIA24,PRIC24,PRIA25,
5PRIB25,PRIA26,PRIP26,PRIC26,PRNA1,PRNA2,PRNA3,PRNB3,PRNA4,PRNE4,
6PRNA5,PRNA6,PRNA7,PRNA8,PRNB8,PRNA9,PRNG9,PRNA10,PRNA11,PRNG11,
7PRNA12,PRNB12,PRNE12,PRNA13,PRNE13,PRNA14,PRNE14,PRNA15,PRNA16,
8PRNA17,PRNA18,PRNB18,PRNA19,PRNB19,PRNC19,PRNA20,PRNC20,PRNA21,
9PRNB21,PRNA22,PRNB22,PRNC22,PLPC,PLA1,PLA3,PLB3,PLA4,PLA6,PLA8,
APLB8,PLA9,PLA11,PLR11,PLA13,PLB13,PLC13,PLD13,PLA14,PLD14,PLA15,
BPLB15,PLE15,PLF15,PLA16,PLE16,PLA17,PLA18,PLB18,PLC18,PLA19,PLA20,
CPLB20,PLA21,PLB21,PLC21,PTA1,PTD1,PTA4,PTB4,PTA5,PTB5,PTF5,PTA6,
DPTC6,PTA7,PTB7,PTC7,PTJC,PTA8,PTD8,PTA9,PTB9,PTA10,PTB10,PTC10,
EPEA3,PEB3,PEA4,PEE4,PEA5,PEF5,PEA6,PEB6,PEE6,PEA7,PEE7,PEA8,PEA9,
FPEA10,PER10,PEC10,PEA11,PEB11,PEE11,PERC,PSPC,PSA3,PSB3,PSA4,PSA4,
GPSA5,PSF5,PSA6,PSF6,PSG6,PSA7,PSF7,PSA8,PSA9,PSA10,PSB10,PSC10,
HPSA11,PSB11,PSE11,CFT,PFT,CFCASE,PFCASE,CFC,PFC,CFM,PFM,IYEAR
COMMON /COSTIN/ PRIB1,PRIC1,PRIB2,PRIC2,PRIB4,PRIC4,PRID4,PRIE5,WHC00280
1PPIC5,PRIB9,PRIC9,PRID9,PRIE9,PRIF9,PRIB11,PRIC11,PRID11,PRIE11,WHC00290
2PRIF11,PRIC12,PRID12,PRIB13,PRIC13,PRID13,PRIB14,PRIC14,PRID14,WHC00300
3PRIB15,PRIC15,PRID15,PRIB16,PRIC16,PRID16,PRIB17,PRIC17,PRID17,WHC00310
4PRIE17,PRIC18,PRID18,PRIB19,PRIC19,PRID19,PRIB24,PRNC1,PRNC1,PRNB2,WHC00320
5,PRNC2,PRNB4,PRNC4,PRND4,PRNB5,PRNC5,PRNB9,PRNC9,PRNC9,PRNE9,PRNE9,WHC00330
6,PRNB11,PRNC11,PRND11,PRNE11,PRNF11,PRNC12,PRND12,PRNB13,PRNC13,WHC00340
7PRND13,PRNB14,PRNC14,PRND14,PRNB15,PRNC15,PRND15,PRNB16,PRNC16,WHC00350
8PRND16,PRNB17,PRNC17,PRND17,PRNE17,PRNB20,PLB1,PLC1,PLA2,PLB2,PLB4,WHC00360
9,PLC4,PLA5,PLB5,PLB6,PLC6,PLA7,PLB7,PLB9,PLC9,PLA10,PLB10,PLA12,WHC00370
APLB12,PLB14,PLC14,PLC15,PLD15,PLB16,PLC16,PLD16,PLB19,PLC19,PTB1,WHC00380
BPTC1,PTA2,PTB2,PTA3,PTB3,PTC5,PTD5,PTB6,PTC6,PTD6,PTB8,PTC8,PEA1,WHC00390
CPER1,PEC1,PEA2,PEB2,PEC2,PEB4,PEC4,PED4,PEB5,PEC5,PEF5,PEE5,PEC6,WHC00400
DPEC6,PEB7,PEC7,PED7,PEC11,PED11,PSA1,PSB1,PSA1,PSB1,PSA2,PSB2,PSA2,PSB2,WHC00410
E,PSA4,PSD4,PSB5,PSA5,PSD5,PSA5,PSB6,PSA6,PSD6,PSA6,PSB7,PSA7,PSD7,WHC00420
FPE7,PSA11,PSD11,PRND22,PLD21,PLE21,PTD10,PTD10,PRID26,WHC00430
COMMON /COSTIN/ PROFIT,QD,R,AFA1,AFB1,AFB1,AFB1,AFB1,AFB1,AFB1,AFB1,WHC00440
1AFG2,AFA3,AFB3,AFG3,AFA4,AFB4,AFB4,AFB4,AFB4,AFB4,AFB4,AFB4,WHC00450
2AFA6,AFB6,AFG6,AFA7,AFB7,AFB7,AFB7,AFB7,AFB7,AFB7,AFB7,WHC00460
3AFB9,AFB9,AFB9,AFB10,AFB10,AFB10,AFB10,AFB10,AFB10,AFB10,WHC00470
4AFB12,AFB12,AFB13,AFB13,AFB13,AFB13,AFB13,AFB13,AFB13,AFB13,WHC00480
5WA2,WD2,WE2,KGAIN,CA1,CE1,CF1,CA2,CE2,CF2,CA3,CE3,CF3,GA1,GB1,GF1,WHC00490
6KLE6,KG16,KSTAB,KAGATE,NCHAN,KSGATE,GA2,GB2,GK2,GA3,GB3,GQ3,GA4,WHC00500


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7CP4,CM4,CA5,CR5,GH5,KG,KC,KW,KA,KP,IGTYPE,ICTYPE,IPRCST      WHC00510
COMMON /COSTIN/ AFE1,AFF1,AFG1,AFH1,AFC2,AFD2,AFF2,AFF2,AFC3,    WHC00520
1AFD3,AFE3,AFF3,AFE4,AFF4,AFG4,AFH4,AFI4,AFD5,AFE5,AFF5,AFG5,AFC6, WHC00530
2AFD6,AFE6,AFF6,AFB7,AFE8,AFF8,AFG8,AFH8,AFF9,AFF9,AFG9,AFH9,AFI9, WHC00540
3AFD10,AFE10,AFF10,AFG10,AFC11,AFD11,AFE11,AFF11,AFB12,WB1,WC1,WC1, WHC00550
4WP2,WC2,CB1,CC1,CD1,CB2,CC2,CD2,CB3,CC3,CD3,GC1,GD1,GF1,GC2,GD2,    WHC00560
5CF2,CF2,CG2,GH2,GJ2,GJ2,GC3,GD3,GE3,GF3,GG3,GH3,GI3,GJ3,GK3,GL3,    WHC00570
6CM3,GN3,GP3,CC4,CD4,GE4,GF4,GG4,GH4,GI4,GJ4,GK4,GL4,GC5,GD5,GE5,    WHC00580
7CF5,GG5,CFTTAB(11),PFTTAB(11) WHC00590
COMMON /CSTPRV/ CBLC,CBMC,CCASE,CCFU,CCL,CCM,CCOMI,CCOML,CCOMM,    WHC00600
1 CCONT,CCPD,CERFU,CBRD,CETJ,CEXIN,CGFU,CGRD, WHC00610
2 COT,COTOT,CIGN,CIRJFU, CIRJRD, CLF,CLFL,CLGG,CLI,CLM, WHC00620
3 CLRFD,CLRD,CLRT,CLTC,CLTP,CM,CMGG,CMM,CMT,CMT, WHC00630
4 CMV,CNOZ,CNRJFU, CNRJRD, CP,CPAFI,CPENG,CPL,CPLC, WHC00640
5 CPMFGL,CPMFGM,CPOA,CPR,CPRC,CPS,CPSMGG,CPSN2,CPSRAM,CPSSGG, WHC00650
6 CPTOOL,CRAFI,CREDEV,CREG,CRENG,CRTD,CRJC,CRMFGI,CRMFGM,CROA, WHC00660
7 CRTOOL,CSA,CSRFD,CSRBD,CSRT,CT,CTAFI,CTC,CTEB,CTIRJ,CTJFU, WHC00670
8 CTJLF,CTJLFL,CTJRD,CTJT, CTL,CTM,CTNRJ,CTP,CWH,CWHFU,CWHR, WHC00680
9 CBODC,CRPS,CPFU,PROFPR,PRUAF,PRRAF,CCLB,CCMB,CTCB,CLIB,CNCZB, WHC00690
A CPRB,CPLB,CIGNB,CSAB,PROFEX WHC00700
NAMELIST /FRRPRT/ CWHR,CWHFU,CWH WHC00710
XFUZE=K FUZE WHC00720
1 CWHP=WA1*((WB1+WC1*WWH+WD1*XFUZE)*WE1+WF1) WHC00730
2 CWHFU=WA2*(1.28*(WB2+WC2*SQR(WWH))*WD2/600.+WE2) WHC00740
3 CWH=CWHR+CWHFU WHC00750
IF (IPRCST.NE.C) WRITE (6,FRRPRT) WHC00760
RETURN WHC00770
END WHC00780

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SUBROUTINE PLRCST

LIQUID ROCKET PROPULSION COST

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REAL NOZWT,MP
COMMON /COMVLS/ WTANK,VEXIN,VREQ,GGW,HPPUMP,WTFUEL,WCOMM,VCOMI,    PLRC0010
1 P5,Y1,WNOZ,KFM,MATTK,A,DCOM,WMC,VBI,DHRT,RNOZI,NCZWT,MP,CASEM,    PLRC0020
2 FNET,WT,WF,FMAX,S,T4,MEITJ,ZXNB,D,WM,FC,PPEAK,BSP,NDCT,CA,WCS,    PLRC0030
3 WWH,WTC,WTP,WGG,WSC,WLV,VT,WQ,WP,DP,WN,METAL,NCONF    PLRC0040
COMMON /COSTIN/ PRIA1,PRIA2,PRJC,PRIA3,PRI3,PRIA4,PRIE4,PRIA5,    PLRC0050
1PRIA6,PRIA7,PRIA8,PRI8,PRIA9,PRIG9,PRIA10,PRIA11,PRIG11,PRIA12,    PLRC0060
2PRI12,PRIE12,PRIA13,PRIE13,PRIA14,PRIE14,PRIA15,PRIE15,PRIA16,    PLRC0070
3PRIF16,PRIA17,PRIF17,PRIA18,PRI18,PRIE18,PRIA19,PRIE19,PRIA20,    PLRC0080
4PPJA21,PRIA22,PRI22,PRIA23,PRI23,PRIC23,PRIA24,PRIC24,PRIA25,    PLRC0090
5PPIB25,PRIA26,PRIB26,PRIC26,PRNA1,PRNA2,PRNA3,PRNB3,PRNA4,PRNE4,    PLRC0100
6PRNA5,PRNA6,PRNA7,PRNA8,PRNB8,PRNA9,PRNG9,PRNA10,PRNA11,PRNG11,    PLRC0110
7PRNA12,PRNB12,PRNE12,PRNA13,PRNE13,PRNA14,PRNE14,PRNA15,PRNA16,    PLRC0120
8PPNA17,PRNA18,PRNB18,PRNA19,PRNB19,PRNC19,PRNA20,PRNC20,PRNA21,    PLRC0130
9PRNB21,PRNA22,PRNB22,PRNC22,PLPC,PLA1,PLA3,PLB3,PLA4,PLA6,PLA8,    PLRC0140
APLB8,PLA9,PLA11,PLB11,PLA13,PLB13,PLC13,PLD13,PLA14,PLD14,PLA15,    PLRC0150
BPLB15,PLF15,PLF15,PLA16,PLE16,PLA17,PLA18,PLB18,PLC18,PLA19,PLA20,    PLRC0160
CPLB20,PLA21,PLB21,PLC21,PTA1,PTD1,PTA4,PTB4,PTA5,PTB5,PTF5,PTA6,    PLRC0170
DPT6,PTA7,PTB7,PTC7,PTJC,PTA8,PTD8,PTA9,PTB9,PTA10,PTB10,PTC10,    PLRC0180
EPEA3,PER3,PEA4,PEE4,PEA5,PEF5,PFA6,PER6,PEE6,PEA7,PEE7,PEA8,PEA9,    PLRC0190
PLRC0200
PLRC0210
PLRC0220
PLRC0230
PLRC0240

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FPEA10,PER10,PEC10,PEA11,PER11,PEE11,PERC,PSPC,PSA3,PSR3,PSA4,PSE4,PLRC0250
 CPSA5,PSF5,PSA6,PSF6,PSG6,PSA7,PSF7,PSA8,PSA9,PSA10,PSB10,PSC10, PLRC0260
 HPSA11,PSR11,PSE11,CFT,PFT,CFCASE,PFCASE,CFC,PFC,CFM,PFM,IYEAR PLRC0270
 COMMON /COSTIN/ PRIB1,PRIC1,PRIB2,PRIC2,PRIB4,PRIC4,PRID4,PRIB5,PLRC0280
 1PRIC5,PRIB9,PRIC9,PRID9,PRIE9,PRIF9,PRIB11,PRIC11,PRIC11,PRIE11, PLRC0290
 2PRIF11,PRIC12,PRID12,PRIB13,PRIC13,PRID13,PRIB14,PRIC14,PRID14, PLRC0300
 3PRIB15,PRIC15,PRID15,PRIB16,PRIC16,PRID16,PRIB17,PRIC17,PRID17, PLRC0310
 4PRIF17,PRIC18,PRID18,PRIB19,PRIC19,PRID19,PRIB24,PRNB1,PRNC1,PRNF2PLRC0320
 5,PRNC2,PRNB4,PRNC4,PRND4,PRNB5,PRNC5,PRNB9,PRNC9,PRND9,PRNE9,PRNF9PLRC0330
 6,PRNB11,PRNC11,PRND11,PRNE11,PRNF11,PRNC12,PRND12,PRNB13,PRNC13, PLRC0340
 7PRND13,PRNB14,PRNC14,PRND14,PRNB15,PRNC15,PRND15,PRNB16,PRNC16, PLRC0350
 8PRND16,PRNB17,PRNC17,PRND17,PRNE17,PRNB20,PLB1,PLC1,PLA2,PLB2,PLB4PLRC0360
 9,PLC4,PLA5,PLB5,PLB6,PLC6,PLA7,PLB7,PLB9,PLC9,PLA10,PLB10,PLA12, PLRC0370
 APLR12,PLR14,PLC14,PLC15,PLD15,PLB16,PLC16,PLD16,PLB19,PLC19,PTR1, PLRC0380
 BPTC1,PTA2,PTB2,PTA3,PTB3,PTC5,PTD5,PTB6,PTC6,PTD6,PTB8,PTC9,PEA1, PLRC0390
 CPER1,PEC1,PEA2,PER2,PEC2,PEB4,PEC4,PED4,PEB5,PEC5,PED5,PEE5,PEC6, PLRC0400
 CPED6,PEP7,PEC7,PED7,PEC11,PED11,PSA1,PSB1,PSC1,PSA2,PSB2,PSC2,PSB4PLRC0410
 E,PSC4,PSD4,PSB5,PSC5,PSD5,PSE5,PSB6,PSC6,PSD6,PSE6,PSB7,PSC7,PSD7,PLRC0420
 FPSE7,PSC11,PSD11,PRND22,PLD21,PLE21,PTD10,PTE10,PRID26 PLRC0430
 COMMON /COSTIN/ PROFIT,QD,R,AFA1,AFB1,AFC1,AFD1,AFI1,AFA2,AFR2, PLRC0440
 1AFG2,AFA3,AFB3,AFG3,AFA4,AFB4,AFC4,AFD4,AFJ4,AFA5,AFB5,AFC5,AFH5, PLRC0450
 2AFA6,AFB6,AFG6,AFA7,AFC7,AFD7,AFA8,AFB8,AFC8,AFD8,AFI8,AFA9,AFR9, PLRC0460
 3AFG9,AFD9,AFJ9,AFA10,AFB10,AFC10,AFH10,AFA11,AFB11,AFG11,AFI12, PLRC0470
 4AFC12,AFD12,AFA13,AFB13,AFC13,AFA14,AFB14,AFC14,KFUZE,WA1,WE1,WF1,PLRC0480
 5WA2,WD2,WE2,KGAIN,CA1,CE1,CF1,CA2,CE2,CF2,CA3,CE3,CF3,GA1,GB1,GF1,PLRC0490
 6KLE6,KGT6,KSTAR,KAGATE,NCHAN,KSGATE,GA2,GB2,GK2,GA3,GB3,GQ3,GA4, PLRC0500
 7CR4,CM4,GA5,GB5,GH5,KG,KC,KW,KA,KP,IGTYPE,ICTYPE,IIRCST PLRC0510
 COMMON /COSTIN/ AFF1,AFF1,AFG1,AFH1,AFC2,AFD2,AFF2,AFF2,AFC3, PLRC0520
 1AFD3,AFF3,AFF3,AFF4,AFF4,AFG4,AFH4,AFI4,AFD5,AFF5,AFF5,AFG5,AFC6, PLRC0530
 2AFD6,AFF6,AFF6,AFR7,AFF8,AFF8,AFG8,AFH8,AFF9,AFF9,AFG9,AFH9,AFI9, PLRC0540
 3AFD10,AFF10,AFF10,AFG10,AFC11,AFD11,AFF11,AFF11,AFB12,WB1,WC1,WD1, PLRC0550
 4WP2,WC2,CB1,CC1,CD1,CB2,CC2,CD2,CB3,CC3,CD3,GC1,GC1,GE1,GC2,GD2, PLRC0560
 5CF2,CF2,GG2,GH2,GI2,GJ2,GC3,GD3,GE3,GF3,GG3,GH3,GI3,GJ3,GK3,GL3, PLRC0570
 6CM3,GN3,GP3,GC4,GD4,GE4,GF4,GG4,GH4,GI4,GJ4,GK4,GL4,GC5,GD5,GF5, PLRC0580
 7CF5,GG5,CFTTAB(11),PFTTAB(11) PLRC0590
 COMMON /CSTPRV/ CBLC,CBMC,CCASE,CCFU,CCL,CCM,CCOMI,CCOML,CCOMM, PLRC0600
 1 CCONT,CCRD,CBFCU,CERRD,CETJ,CEXIN,CGFU,CGRD, PLRC0610
 2 CGT,CGTQT,CIGN,CIRJFU, CIRJRD, CLF,CLFL,CLGG,CLT,CLM, PLRC0620
 3 CLRUF,CLRRD,CLPT,CLTC,CLTP,CM,CMGG,CM,CMTC,CMTP, PLRC0630
 4 CMV,CNOZ,CNRJFU, CNRJRD, CP,CPAFI,CPENG,CFL,CPLC, PLRC0640
 5 CPMFGL,CPMEGM,CPOA,CPR,CPRC,CPS,CPSMG,CPN2,CPSRAM,CPSSGG, PLRC0650
 6 CPTOOL,CRAFI,CRDEV,CREG,CRENG,CRTTO,CRJC,CRMFG,CRMFGM,CRO4, PLRC0660
 7 CRTOOL,CSA,CSRUF,CSRRO,CSRT,CT,CTAFI,CTC,CTEB,CTIRJ,CTJFU, PLRC0670
 8 CTJLF,CTJLFL,CTJRD,CTJT, CTL,CTM,CTNRJ,CTP,CWH,CWHFU,CWHR, PLRC0680
 9 CBODC,CRPS,CPFU,PROFPR,PRFUAF,PRRAF,CCLB,CCMB,CTCB,CLIB,CNOZR, PLRC0690
 A CPRB,CPLB,CIGNB,CSAB,PROFEX PLRC0700
 DIMENSION PLB14A(3) PLRC0710
 NAMELIST /ERRPRT/ CLTC,CMTC,CTC,CLTP,CMTP,CLGG,CMGG,CTP,CLM,CM, PLRC0720
 1 CM,CGT,CPS,CT,CP,CPL,CSA,CLRUF, CLRRD,CLRT PLRC0730
 DATA PLB14A/2165.,16495.,7191./ PLRC0740
 PLB14U=PLB14A(METAL) PLRC0750
 PLC14U=.26C8 PLRC0760
 IF (PLR14 .NE. 0.) PLB14U=PLB14 PLRC0770
 IF (PLC14 .NE. 0.) PLC14U=PLC14 PLRC0780
 1 CLTC=PLA1*PLB1*WTC**PLC1/1000. PLRC0790

2	CMTC=PLA2*1.35*WTC**PLB2/1000.	PLRC0800
3	CTC=PLA3*(CLTC+CMTC)+PLB3	PLRC0810
4	CLTP=PLA4*PLB4*(WTP-WGG-WSC)**PLC4/1000.	PLRC0820
5	CMTP=PLA5*1.35*(WTP-WGG-WSC)**PLB5/1000.	PLRC0830
6	CLGG=PLA6*PLB6*(WGG+WSC)**PLC6/1000.	PLRC0840
7	CMGG=PLA7*1.35*(WGG+WSC)**PLB7/1000.	PLRC0850
8	CTP=PLA8*(CLTP+CMTP+CLGG+CMGG)+PLB8	PLRC0860
9	CLM=PLA9*PLB9*WLV**PLC9/1000.	PLRC0870
10	CMM=PLA10*1.35*WLV**PLB10/1000.	PLRC0880
11	CM=PLA11*(CLM+CMM)+PLB11	PLRC0890
12	CCT=PLA12*1.059*VGT**PLB12/1000.	PLRC0900
13	CPS=PLA13*(CGT+PLB13+PLC13)+PLD13	PLRC0910
14	CT=PLA14*PLB14*1.1*WT**PLC14U/1000.+PLD14	PLRC0920
15	CP=PLA15*(PLB15*(PLC15/WO)**PLD15*WO+PLE15*(PLC15/WF)**PLD15*WF)	PLRC0930
	1 /1000.+PLF15	PLRC0940
16	CPL=PLA16*PLB16*1.1*(PLC16/WP)**PLD16*WP+PLE16	PLRC0950
17	CSA=PLA17	PLRC0960
18	CLRFU=(PLA18*1.15*PLB18*(CTC+CTP+CM+CPS+CT+CP+CPL+CSA)+PLA18*PLC18	PLRC0970
	1)*(1.+PLPC)	PLRC0980
	CPFU=CLRFU	PLRC0990
	PROFPR=CLRFU*PLPC/(1.+PLPC)	PLRC1000
21	CL22D=PLA21*(PLB21*(1.462*PLD21*FMAX+PLE21)+PLC21)*(1.+PLPC)	PLRC1010
	CRPS=CL22D	PLRC1020
22	CLRT=CL22D+CLRFU	PLRC1030
	CLTC=CLTC*PLA18	PLRC1040
	CMTC=CMTC*PLA18	PLRC1050
	CTC=CTC*PLA18	PLRC1060
	CLTP=CLTP*PLA18	PLRC1070
	CMTP=CMTP*PLA18	PLRC1080
	CLGG=CLGG*PLA18	PLRC1090
	CMGG=CMGG*PLA18	PLRC1100
	CTP=CTP*PLA18	PLRC1110
	CLM=CLM*PLA18	PLRC1120
	CMM=CMM*PLA18	PLRC1130
	CM=CM*PLA18	PLRC1140
	CGT=CGT*PLA18	PLRC1150
	CPS=CPS*PLA18	PLRC1160
	CT=CT*PLA18	PLRC1170
	CP=CP*PLA18	PLRC1180
	CPL=CPL*PLA18	PLRC1190
	CSA=CSA*PLA18	PLRC1200
	IF (IPRCST .NE. 0) WRITE (6,ERRPRT)	PLRC1210
	RETURN	PLRC1220
	END	PLRC1230

SUBROUTINE PFBCST

EXTERNAL BOOSTER PROPULSION COST

COMMON /CONLY/ KPUTG, DIAFRT, SOMMOR(8)

REAL NOZWT,MP

COMMON /COMVLS/ WTANK,VEXIN,VREQ,GGW,HPPUMP,UTFUEL,WCOMP,VCCMI,
 1 R5,Y1,WNOZ,KFM,MATTK,A,DCOM,WMC,VBI,DTHRT,RNOZI,NCZWT,MP,CASEM,

PERC0010

PERC0020

PERC0030

PFBC0040

PFBC0050

PFBC0060

PFBC0070

PFBC0080

2 FNET,WT,WF,FMAX,S,T4,ME TTJ,ZXNR,D,WM,FC,PPEAK,RSP,NDET,QA,WCS, PERC0090
 3 WWH,WTC,WTP,WGG,WSC,WLV,VTG,WD,WP,DP,WN,METAL,NCONFG PERC0100
 COMMON /COSTIN/ PRIA1,PRIA2,PRJC,PRIA3,PRIB3,PRIA4,PRIE4,PRIA5, PEPC0110
 1PRIA6,PRIA7,PRIA8,PRIB8,PRIA9,PRIG9,PRIA10,PRIA11,PRIG11,PRIA12, PEBC0120
 2PRIB12,PRIE12,PRIA13,PRIE13,PRIA14,PRIE14,PRIA15,PRIE15,PRIA16, PFBC0130
 3PRIE16,PRIA17,PRIE17,PRIA18,PRIB18,PRIE18,PRIA19,PRIE19,PRIA20, PFRC0140
 4PPIA21,PRIA22,PRIB22,PRIA23,PRIB23,PRIC23,PRIA24,PRIC24,PRIA25, PFBC0150
 5PRIB25,PRIA26,PRIB26,PRIC26,PRNA1,PRNA2,PRNA3,PRNB3,PRNA4,PRNF4, PEFC0160
 6PRNA5,PRNA6,PRNA7,PRNA8,PRNB8,PRNA9,PRNG9,PRNA10,PRNA11,PRNG11, PEFC0170
 7PRNA12,PRNB12,PRNE12,PRNA13,PRNE13,PRNA14,PRNE14,PRNA15,PRNA16, PFPC0180
 8PRNA17,PRNA18,PRNB18,PRNA19,PRNB19,PRNC19,PRNA20,PRNC20,PRNA21, PFBC0190
 9PRNB21,PRNA22,PRNB22,PRNC22,PLPC,PLA1,PLA3,PLB3,PLA4,PLA6,PLA8, PFRC0200
 APLB8,PLA9,PLA11,PLB11,PLA13,PLB13,PLC13,PLD13,PLA14,PLD14,PLA15, PFBC0210
 PPLB15,PLF15,PLF15,PLA16,PLE16,PLA17,PLA18,PLB18,PLC18,PLA19,PLA20, PERC0220
 CPLB20,PLA21,PLB21,PLC21,PTA1,PTD1,PTA4,PTB4,PTA5,PTB5,PTA6, PFBC0230
 DPTA6,PTA7,PTB7,PTC7,PTJC,PTA8,PTD8,PTA9,PTB9,PTA10,PTB10,PTC10, PERC0240
 EPPA3,PER3,PEA4,PEF4,PEA5,PEF5,PEA6,PER6,PEF6,PEA7,PEE7,PEA8,PEA9, PERC0250
 FPEA10,PER10,PEC10,PEA11,PEB11,PEE11,PEBC,PSPC,PSA3,PSB3,PSA4,PSE4, PFBC0260
 GPSA5,PSF5,PSA6,PSF6,PSG6,PSA7,PSF7,PSA8,PSA9,PSA10,PSB10,PSC10, PFRC0270
 HPSA11,PSB11,PSE11,CFT,PFT,CFCASE,PFCASE,CFC,PFC,CFM,PFM,IYFAR PFRC0280
 COMMON /COSTIN/ PRIB1,PRIC1,PRIB2,PRIC2,PRIB4,PRIC4,PRID4,PRIE5, PERC0290
 1PRIC5,PRIB9,PRIC9,PRID9,PRIE9,PRIF9,PRIB11,PRIC11,PRID11,PRIE11, PERC0300
 2PRIF11,PRIC12,PRID12,PRIB13,PRIC13,PRID13,PRIB14,PRIC14,PRID14, PFBC0310
 3PPRIB15,PRIC15,PRID15,PRIB16,PRIC16,PRID16,PRIB17,PRIC17,PRID17, PFRC0320
 4PRIE17,PRIC18,PRID18,PRIB19,PRIC19,PRID19,PRIB24,PRNB1,PRNC1,PRNB2,PERC0330
 5,PRNC2,PRNB4,PRNC4,PRND4,PRNB5,PRNC5,PRNB9,PRNC9,PRND9,PRNE9,PRNF9,PERC0340
 6,PRNB11,PRNC11,PRND11,PRNE11,PRNF11,PRNC12,PRND12,PRNB13,PRNC13, PFRC0350
 7PRND13,PRNB14,PRNC14,PRND14,PRNB15,PRNC15,PRND15,PRNB16,PRNC16, PERC0360
 8PRND16,PRNB17,PRNC17,PRND17,PRNE17,PRNB20,PLB1,PLC1,PLA2,PLB2,PLB4,PFBC0370
 9,PLC4,PLA5,PLB5,PLB6,PLC6,PLA7,PLB7,PLB9,PLC9,PLA10,PLB10,PLA12, PERC0380
 APLB12,PLB14,PLC14,PLC15,PLD15,PLB16,PLC16,PLD16,PLB19,PLC19,PTB1, PFRC0390
 BPTC1,PTA2,PTB2,PTA3,PTB3,PTC5,PTD5,PTB6,PTC6,PTD6,PTB8,PTC8,PEA1, PERC0400
 CPEB1,PEC1,PEA2,PER2,PEC2,PEB4,PEC4,PED4,PEB5,PEC5,PEB5,PEE5,PEC6, PERC0410
 DPEB6,PER7,PEC7,PEC11,PEB11,PSA1,PSB1,PSA2,PSB2,PSA2,PSB2,PSA2,PSB2,PFBC0420
 E,PSA4,PSD4,PSB5,PSA5,PSD5,PSE5,PSB6,PSA6,PSD6,PSE6,PSB7,PSA7,PSB7,PFRC0430
 FPSF7,PSA11,PSD11,PRND22,PLD21,PLE21,PTD10,PTA10,PRID26 PERC0440
 COMMON /COSTIN/ PROFIT,QD,R,AFA1,AFB1,AFC1,AFD1,AFI1,AFA2,AFB2, PERC0450
 1AFG2,AFA3,AFB3,AFG3,AFA4,AFB4,AFC4,AFD4,AFJ4,AFA5,AFB5,AFC5,AFH5, PFRC0460
 2AFA6,AFB6,AFG6,AFA7,AFC7,AFD7,AFA8,AFB8,AFC8,AFD8,AFI8,AFA9,AFB9, PFBC0470
 3AFC9,AFD9,AFJ9,AFA10,AFB10,AFC10,AFH10,AFA11,AFB11,AFG11,AFA12, PERC0480
 4AFC12,AFD12,AFA13,AFB13,AFC13,AFA14,AFB14,AFC14,KFUZE,WAI,WE1,WF1, PERC0490
 5WA2,WD2,WE2,KGAIN,CA1,CE1,CF1,CA2,CE2,CF2,CA3,CE3,CF3,GA1,GB1,GF1, PFRC0500
 6KLF6,KGT6,KSTAB,KAGATE,NCHAN,KSGATE,GA2,GB2,GK2,GA3,GB3,GQ3,GA4, PFBC0510
 7GB4,GM4,GA5,GB5,GH5,KG,KC,KW,KA,KP,IGTYPE,ICTYPE,I PRCT PFRC0520
 COMMON /COSTIN/ AFE1,AFF1,AFG1,AFH1,AFC2,AFD2,AFF2,AFF2,AFC3, PEBC0530
 1AFD3,AFF3,AFF3,AFF4,AFF4,AFG4,AFH4,AFI4,AFD5,AFF5,AFF5,AFG5,AFC6, PFRC0540
 2AFD6,AFF6,AFF6,AFB7,AFF8,AFF8,AFG8,AFH8,AFF9,AFF9,AFG9,AFH9,AFI9, PFRC0550
 3AFD10,AFF10,AFF10,AFG10,AFC11,AFD11,AFF11,AFF11,AFB12,WR1,WC1,PFRC0560
 4WR2,WC2,CB1,CC1,CB2,CC2,CC2,CB3,CC3,CC3,GC1,GD1,GE1,GC2,GD2, PFRC0570
 5GE2,GF2,GG2,GH2,GI2,GJ2,GC3,GD3,GE3,GF3,GG3,GH3,GI3,GJ3,GK3,GL3, PFRC0580
 6GM3,CN3,GP3,GC4,CD4,GE4,GF4,GG4,GH4,GI4,GJ4,GK4,GL4,GC5,GD5,GE5, PFBC0590
 7GF5,GG5,CFTTAB(11),PFTTAB(11) PFBC0600
 COMMON /CSTPRV/ CRLC,CBMC,CCASE,CCFU,CCL,CCM,CCCM1,CCOML,CCOMM, PFRC0610
 1 CCONT,CCRD,CEBFU,CEBRD,CETJ,CEXIN,CGFU,CGRD, PFRC0620
 2 CGT,CGTOT,CIGN,CIRJFU, CIRJRD, CLF,CLFL,CLGG,CLI,CLM, PFRC0630

3	CLRFU,CLRRD,CLRT,CLTC,CLTP,CM,CMGG,CMF,CMTC,CMTP,	PERC0640
4	CMV,CNOZ,CNRJFU,CNRJRD,CP,CPAFI,CPENG,CPL,CPLC,	PERC0650
5	CPMFGL,CPMFGM,CPCA,CPR,CPRC,CPS,CPSMGG,CPSN2,CPSRAM,CPSSGG,	PERC0660
6	CPTDOL,CRAFI,CRDEV,CREG,CRENG,CRFTO,CRJC,CRMFGI,CRMFGM,CRQA,	PERC0670
7	CRTDOL,CSA,CSRFB,CSRRO,CSRT,CT,CTAFI,CTC,CTEB,CTIRJ,CTJFU,	PERC0680
8	CTJLF,CTJLFL,CTJRD,CTJT,CTL,CTM,CTNRJ,CTP,CWH,CWHFU,CWHR,	PERC0690
9	CBOQC,CRPS,CPUF,PROFPR,PRFUAF,PRRAF,CCLB,CCMB,CTCB,CLIB,CNCZR,	PERC0700
A	CPRB,CPLB,CIGNB,CSAB,PROFEX	PERC0710
	NAMLIST /ERRPRT/ CCLB,CCMB,CTCB,CLIB,CNOZR,CPRB,CPLB,CIGNB,CSAB,	PERC0720
1	CEBFU,CERRD,CTEB	PERC0730
	DSL IK = D	PERC0740
	C = C * DIAFRT	PERC0750
	I=CASEM	PERC0760
	CFMU=CFETTAB(I)	PERC0770
	PFMU=PFETTAB(I)	PERC0780
	IF (CFM .NE. 0.) CFMU=CFM	PERC0790
	IF (PFM .NE. 0.) PFMU=PFM	PERC0800
1	CCLR=PEA1*CFMU*(PEB1/WMC)**PEC1*WMC	PERC0810
2	CCMB=1.1*PEA2*PFMU*(PEB2/WMC)**PEC2*WMC	PERC0820
3	CTCR=PEA3*(CCLR+CCMB)+PEB3	PERC0830
4	CLIR=1.1*PEA4*PEB4*(PEC4/VR1)**PED4*VBI+PEE4	PERC0840
5	CNOZR=1.1*PEA5*PEB5*(PEC5+PED5*DTHT+PEE5*RNQZI)*NCZWT+PEF5	PERC0850
6	CPRB=PEA6*PEB6*MP/1000.*(PEC6/MP)**PED6+PEE6	PERC0860
7	CPLB=1.1*PEA7*PEB7*MP*(PEC7/MP)**PED7+PEE7	PERC0870
8	CIGNB=PEA8	PERC0880
9	CSAB=PEA9	PERC0890
10	CEBFU=Z XNB*(PEA10*(PEB10*(CTCB+CLIB+CNOZR+CPRB+CPLB+CIGNB+CSAB)	PERC0900
	+PEC10)*(1.+PEBC))	PERC0910
	PROFEX=CEBFU*PEBC/(1.+PEBC)	PERC0920
11	CERRD=PEA11*(PEB11*PEC11*(D*WM)**PED11*1.462+PEE11)*(1.+PEBC)	PERC0930
12	CTEB=CEBRD+CEBFU	PERC0940
	CCLR=CCLR*PEA10	PERC0950
	CCMB=CCMB*PEA10	PERC0960
	CTCR=CTCR*PEA10	PERC0970
	CLIB=CLIB*PEA10	PERC0980
	CNOZR=CNOZR*PEA10	PERC0990
	CPRB=CPRB*PEA10	PERC1000
	CPLB=CPLB*PEA10	PERC1010
	CIGNB=CIGNB*PEA10	PERC1020
	CSAB=CSAB*PEA10	PERC1030
	IF (IPRCST .NE. 0) WRITE (6,ERRPRT)	PERC1040
	D = DSL IK	PERC1050
	RETURN	PERC1060
	END	PERC1070

SUBROUTINE PSRCST

SOLID SUSTAINER PROPULSION COST

COMMON /CONLY/ KINDPS,DIAFRT,SWMC,SDTHRT,SRNOZI,SWP,SCMMOR(4)	PSRC0010
REAL NCZWT,MP	PSRC0020
COMMON /COMVLS/ WTANK,VEXIN,VREQ,GGW,HPPUMP,MTFUEL,WCOMP,VCCMI,	PSRC0030
1 R5,Y1,WJZ,KF4,MATTK,A,DCOM,WMC,VBI,DTHT,RNOZI,NCZWT,MP,CASEM,	PSRC0040
	PSRC0050
	PSRC0060
	PSRC0070
	PSRC0080

2 FNET,WT,WF,FMAX,S,T4,METTJ,ZXNR,D,WM,FC,PPEAK,BSP,ADET,QA,WCS, PSRC0090
 3 WWH,WTC,WYP,WGG,WSC,WLV,VT,WQ,WP,DP,WN,METAL,NCONFG PSRC0100
 COMMON /COSTIN/ PRIA1,PRIA2,PRJC,PRIA3,PRIB3,PRIA4,PRIE4,PRIA5, PSRC0110
 1PRIA6,PRIA7,PRIA8,PRIB8,PRIA9,PRIG9,PRIA10,PRIA11,PRIG11,PRIA12, PSRC0120
 2PRIA12,PRIE12,PRIA13,PRIE13,PRIA14,PRIE14,PRIA15,PRIE15,PRIA16, PSRC0130
 3PRIE16,PRIA17,PRIF17,PRIA18,PRIB18,PRIE18,PRIA19,PRIE19,PRIA20, PSRC0140
 4PRIA21,PRIA22,PRIB22,PRIA23,PRIB23,PRIC23,PRIA24,PRIC24,PRIA25, PSRC0150
 5PRIB25,PRIA26,PRIB26,PRIC26,PRNA1,PRNA2,PRNA3,PRNB3,PRNA4,PRNE4, PSRC0160
 6PRNA5,PRNA6,PRNA7,PRNA8,PRNB8,PRNA9,PRNG9,PRNA10,PRNA11,PRNG11, PSRC0170
 7PRNA12,PRNB12,PRNE12,PRNA13,PRNE13,PRNA14,PRNE14,PRNA15,PRNA16, PSRC0180
 8PRNA17,PRNA18,PRNB18,PRNA19,PRNB19,PRNC19,PRNA20,PRNC20,PRNA21, PSRC0190
 9PPNR21,PRNA22,PRNB22,PRNC22,PLPC,PLA1,PLA3,PLB3,PLA4,PLA6,PLA8, PSRC0200
 APLR8,PLA9,PLA11,PLB11,PLA13,PLB13,PLC13,PLD13,PLA14,PLD14,PLA15, PSRC0210
 BPLR15,PLE15,PLF15,PLA16,PLE16,PLA17,PLA18,PLB18,PLC18,PLA19,PLA20, PSRC0220
 CPLR20,PLA21,PLB21,PLC21,PTA1,PTD1,PTA4,PTB4,PTA5,PTB5,PTA6, PSRC0230
 CPTF6,PTA7,PTB7,PTC7,PTJC,PTA8,PTD8,PTA9,PTB9,PTA10,PTB10,PTC10, PSRC0240
 EPEA3,PEB3,PEA4,PEE4,PEA5,PEF5,PEA6,PEB6,PEE6,PEA7,PEE7,PEA8,PEA9, PSRC0250
 FPEA10,PEB10,PEC10,PEA11,PEB11,PEE11,PEBC,PSPC,PSA3,PSB3,PSA4,PSE4, PSRC0260
 GPSA5,PSF5,PSA6,PSF6,PSG6,PSA7,PSF7,PSA8,PSA9,PSA10,PSB10,PSC10, PSRC0270
 HPSA11,PSB11,PSE11,CFT,PFT,CFCASE,PFCASE,CFC,PFC,CFM,PFM,IYEAR PSRC0280
 COMMON /COSTIN/ PRIB1,PRIC1,PRIB2,PRIC2,PRIB4,PRIC4,PRID4,PRIE5, PSRC0290
 1PRIC5,PRIB9,PRIC9,PRID9,PRIE9,PRIF9,PRIB11,PRIC11,PRID11,PRIE11, PSRC0300
 2PRIF11,PRIC12,PRID12,PRIB13,PRIC13,PRID13,PRIB14,PRIC14,PRID14, PSRC0310
 3PRIB15,PRIC15,PRID15,PRIB16,PRIC16,PRID16,PRIB17,PRIC17,PRID17, PSRC0320
 4PRIE17,PRIC18,PRID18,PRIB19,PRIC19,PRID19,PRIB24,PRNE1,PRNC1,PRNB2 PSRC0330
 5,PRNC2,PRNB4,PRNC4,PRND4,PRNB5,PRNC5,PRNB9,PRNC9,PRND9,PRNE9,PRNE9 PSRC0340
 6,PRNB11,PRNC11,PRND11,PRNE11,PRNF11,PRNC12,PRND12,PRNB13,PRNC13, PSRC0350
 7PRND13,PRNB14,PRNC14,PRND14,PRNB15,PRNC15,PRND15,PRNB16,PRNC16, PSRC0360
 8PRND16,PRNB17,PRNC17,PRND17,PRNE17,PRNB20,PLR1,PLC1,PLA2,PLR2,PLR4 PSRC0370
 9,PLC4,PLA5,PLB5,PLB6,PLC6,PLA7,PLR7,PLB9,PLC9,PLA10,PLR10,PLA12, PSRC0380
 APLB12,PLR14,PLC14,PLC15,PLD15,PLB16,PLC16,PLD16,PLR19,PLC19,PTB1, PSRC0390
 BPTC1,PTA2,PTB2,PTA3,PTB3,PTC5,PTD5,PTB6,PTC6,PTD6,PTB8,PTC8,PEA1, PSRC0400
 CPEB1,PEC1,PEA2,PER2,PEC2,PEB4,PEC4,PED4,PEB5,PEC5,PEF5,PEE5,PEC6, PSRC0410
 DPED6,PEB7,PEC7,PED7,PEC11,PED11,PSA1,PSB1,PSC1,PSA2,PSB2,PSC2,PSB4 PSRC0420
 E,PSC4,PSD4,PSB5,PSC5,PSD5,PSE5,PSB6,PSC6,PSD6,PSE6,PSB7,PSC7,PSD7, PSRC0430
 FPSE7,PSC11,PSD11,PRND22,PLD21,PLE21,PTD10,PTD10,PRID26 PSRC0440
 COMMON /COSTIN/ PROFIT,QD,R,AFA1,AFB1,AFC1,AFD1,AFI1,AFA2,AFB2, PSRC0450
 1AFG2,AFA3,AFB3,AFG3,AFA4,AFB4,AFC4,AFD4,AFJ4,AFA5,AFB5,AFC5,AFH5, PSRC0460
 2AFA6,AFB6,AFG6,AFA7,AFC7,AFD7,AFA8,AFB8,AFC8,AFD8,AFI8,AFA9,AFB9, PSRC0470
 3AFC9,AFD9,AFJ9,AFA10,AFB10,AFC10,AFH10,AFA11,AFB11,AFG11,AFA12, PSRC0480
 4AFC12,AFD12,AFA13,AFB13,AFC13,AFA14,AFB14,AFC14,KFUZE,WAI,WEL,WFI, PSRC0490
 5WA2,WD2,WE2,KGAIN,CA1,CE1,CF1,CA2,CE2,CF2,CA3,CE3,CF3,GAI,GB1,GF1, PSRC0500
 6KLF6,KG6,KSTAB,KAGATE,NCHAN,KSGATE,GA2,GB2,GK2,GA3,GB3,GQ3,GA4, PSRC0510
 7GR4,GM4,GA5,GB5,GH5,KG,KC,KW,KA,KP,IGTYPE,ICTYPE,I PRCS T PSRC0520
 COMMON /COSTIN/ AFE1,AFF1,AFG1,AFH1,AFC2,AFD2,AFF2,AFF2,AFC3, PSRC0530
 1AFD3,AFF3,AFF3,AFF4,AFF4,AFG4,AFH4,AFI4,AFD5,AFF5,AFF5,AFG5,AFC6, PSRC0540
 2AFD6,AFF6,AFF6,AFB7,AFF8,AFF8,AFG8,AFH8,AFF9,AFF9,AFG9,AFH9,AFI9, PSRC0550
 3AFD10,AFF10,AFF10,AFG10,AFC11,AFD11,AFF11,AFF11,AFB12,WB1,WC1,WC1, PSRC0560
 4WB2,WC2,CB1,CC1,CB2,CC2,CB3,CC3,CC3,GC1,GD1,GE1,GC2,GD2, PSRC0570
 5GF2,GF2,CG2,GM2,GJ2,GC3,GD3,GE3,GF3,GG3,GH3,GI3,GJ3,GK3,GL3, PSRC0580
 6GM3,GN3,GP3,GC4,GD4,GE4,GF4,GG4,GH4,GI4,GJ4,GK4,GL4,GC5,GD5,GE5, PSRC0590
 7GF5,GG5,CFTTAB(11),PFTTAB(11) PSRC0600
 COMMON /CSTPRV/ CBLC,CBMC,CCASE,CCFU,CCL,CCM,CCOMI,CCOML,CCOMM, PSRC0610
 1 CCONT,CCRD,CEBFU,CEBRD,CETJ,CEXIN,CGFU,CGRD, PSRC0620
 2 CBT,CGTOT,CIGN,CIRJFU, CIRJRD, CLF,CLFL,CLGG,CL1,CLM, PSRC0630

3	CLRFU,CLRRD,CLRT,CLTC,CLTP,CM,CMGG,CMH,CMT,CTP,	PSRC0640
4	CMV,CNOZ,CNRJFU,CNRJRD,CP,CPAFI,CPENG,CPL,CPLC,	PSRC0650
5	CPMFGI,CPMFGM,CPQA,CPR,CPRC,CPS,CPSMGG,CPSN2,CPSRAM,CPSSGG,	PSRC0660
6	CPTOOL,CRAFI,CRDEV,CREG,CRENG,CRETO,CRJC,CRMFGI,CRMFGM,CRQA,	PSRC0670
7	CRTOOL,CSA,CSRFEU,CSRPRD,CSRT,CT,CTAFI,CTC,CTEB,CTIRJ,CTJFU,	PSRC0680
8	CTJLF,CTJLFL,CTJRD,CTJT,CTL,CTM,CTNRJ,CTP,CWH,CWHFU,CWHR,	PSRC0690
9	CRDNC,CRPS,CPFU,PROFPR,PRFUAF,PRRAF,CCLB,CCMB,CTCB,CLIB,CNCZR,	PSRC0700
A	CPRB,CPLB,CIGNB,CSAR,PRCFEX	PSRC0710
	NAMLIST /ERRPRT/ CBLC,CBMC,CCASE,CLI,CNOZ,CPRC,CPLC,CSA,CIGN,	PSRC0720
1	CSRFEU,CSRPRD,CSRT	PSRC0730
	ZS = WMC	PSRC0740
	ZSS = DTHRT	PSRC0750
	ZSSS = RNOZI	PSRC0760
	ZSSSS = WM	PSRC0770
	WMC = SWMC	PSRC0780
	DTHRT = SDTHRT	PSRC0790
	RNOZI = SRNOZI	PSRC0800
	WM = SWM	PSRC0810
1	CRLC=PSA1*1.1*(PSB1/WMC)**PSC1*WMC	PSRC0820
2	CRMC=1.1*PSA2*(PSB2/WMC)**PSC2*WMC	PSRC0830
3	CCASE=PSA3*(CRLC+CRMC)+PSB3	PSRC0840
4	CLI=PSA4*PSB4*1.1*(PSC4/DP)**PSD4*DP+PSE4	PSRC0850
5	CNOZ=PSA5*PSB5*3.3*WN*(PSC5+PSD5*DTHRT+PSE5*RNOZI)+PSF5	PSRC0860
6	CPRC=PSA6*WP*(PSB6/(PSC6*WP))**PSD6*PSF6/PSE6+PSG6	PSRC0870
7	CPLC=PSA7*1.1*PSB7*WP*(PSC7/(PSD7*WP))**PSE7+PSF7	PSRC0880
8	CSA=PSA8	PSRC0890
9	CIGN=PSA9	PSRC0900
10	CSRFEU=PSA10*(1.+PSPC)*(PSB10*1.15*(CCASE+CLI+CNOZ+CPRC+CPLC+CSA	PSRC0910
	+CIGN)+PSC10)	PSRC0920
	CPFU=CSRFEU	PSRC0930
	PROFPR=CSRFEU*PSPC/(1.+PSPC)	PSRC0940
11	CSRPRD=PSA11*(1.+PSPC)*(PSB11*PSC11*(D*WM)**PSD11*1.462+PSE11)	PSRC0950
	CRPS=CSRPRD	PSRC0960
12	CSRT=CSRFEU+CSRPRD	PSRC0970
	CPLC=CRLC*PSA10	PSRC0980
	CRMC=CRMC*PSA10	PSRC0990
	CCASE=CCASE*PSA10	PSRC1000
	CLI=CLI*PSA10	PSRC1010
	CNOZ=CNOZ*PSA10	PSRC1020
	CPRC=CPRC*PSA10	PSRC1030
	CPLC=CPLC*PSA10	PSRC1040
	CSA=CSA*PSA10	PSRC1050
	CIGN=CIGN*PSA10	PSRC1060
	IF (IPRCST.NE.C) WRITE (6,ERRPRT)	PSRC1070
	WMC = 7S	PSRC1080
	DTHRT = ZSS	PSRC1090
	RNOZI = ZSSS	PSRC1100
	WM = ZSSSS	PSRC1110
	RETURN	PSRC1120
	END	PSRC1130

SUBROUTINE PIRCS

PIRC0010
PIRC0020

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INTEGRAL RAMJET PROPLSION COST

REAL NOZWT,MP	PIRC0030
COMMON /COMVLS/ WTANK,VEXIN,VREQ,GGW,HPPUMP,WTFUFL,WCOMM,VCCMI,	PIRC0040
1 RS,Y1,WNOZ,KFM,MATTK,A,DCOM,WMC,VBI,DTHRT,RNOZI,NCZWT,MP,CASEM,	PIRC0050
2 FNET,WT,WF,FMAX,S,T4,METTJ,ZXNB,D,WM,FC,PPEAK,BSP,NDET,QA,WCS,	PIRC0060
3 WWH,WTC,WTP,WGG,WSC,WLV,VT,WO,WP,DP,WN,METAL,NCCNFG	PIRC0070
COMMON /COSTIN/ PRIA1,PRIA2,PRJC,PRIA3,PRIB3,PRIA4,PRIE4,PRIA5,	PIRC0080
1PPIA6,PRIA7,PRIA8,PRIB8,PRIA9,PRIG9,PRIA10,PRIA11,PRIG11,PRIA12,	PIRC0090
2PRIB12,PRIE12,PRIA13,PRIE13,PRIA14,PRIE14,PRIA15,PRIE15,PRIA16,	PIRC0100
3PRIE16,PRIA17,PRIF17,PRIA18,PRIB18,PRIE18,PRIA19,PRIE19,PRIA20,	PIRC0110
4PRIA21,PRIA22,PRIB22,PRIA23,PRIB23,PRIC23,PRIA24,PRIC24,PRIA25,	PIRC0120
5PRIB25,PRIA26,PRIB26,PRIC26,PRNA1,PRNA2,PRNA3,PRNB3,PRNA4,PRNE4,	PIRC0130
6PRNA5,PRNA6,PRNA7,PRNA8,PRNB8,PRNA9,PRNG9,PRNA10,PRNA11,PRNG11,	PIRC0140
7PRNA12,PRNB12,PRNE12,PRNA13,PRNE13,PRNA14,PRNE14,PRNA15,PRNA16,	PIRC0150
8PPNA17,PRNA18,PRNB18,PRNA19,PRNB19,PRNC19,PRNA20,PRNC20,PRNA21,	PIRC0160
9PRNB21,PRNA22,PRNB22,PRNC22,PLPC,PLA1,PLA3,PLB3,PLA4,PLA6,PLA8,	PIRC0170
APLB8,PLA9,PLA11,PLB11,PLA13,PLB13,PLC13,PLD13,PLA14,PLD14,PLA15,	PIRC0180
RPLB15,PLE15,PLF15,PLA16,PLE16,PLA17,PLA18,PLB18,PLC18,PLA19,PLA20,	PIRC0190
CPLB20,PLA21,PLB21,PLC21,PTA1,PTD1,PTA4,PTB4,PTA5,PTB5,PTF5,PTA6,	PIRC0200
DPTE6,PTA7,PTB7,PTC7,PTJC,PTA8,PTD8,PTA9,PTB9,PTA10,PTB10,PTC10,	PIRC0210
FPE43,PEB3,PFA4,PEE4,PEA5,PEF5,PEA6,PEB6,PEE6,PEA7,PEE7,PEA8,PEA9,	PIRC0220
FPE410,PEB10,PEC10,PEA11,PEB11,PEE11,PEBC,PSPC,PSA3,PSB3,PSA4,PSE4,	PIRC0230
GPSA5,PSF5,PSA6,PSF6,PSG6,PSA7,PSF7,PSA8,PSA9,PSA10,PSB10,PSC10,	PIRC0240
HPSA11,PSB11,PSE11,CFT,PFT,CFCASE,PECASE,CFC,PEC,CFM,PFM,IYEAR	PIRC0250
COMMON /COSTIN/ PRIB1,PRIC1,PRIB2,PRIC2,PRIB4,PRIC4,PRID4,PRIB5,	PIRC0260
1PRIC5,PRIB9,PRIC5,PRID5,PRIE9,PRIF9,PRIB11,PRIC11,PRID11,PRIE11,	PIRC0270
2PRIF11,PRIC12,PRID12,PRIB13,PRIC13,PRID13,PRIB14,PRIC14,PRID14,	PIRC0280
3PRIB15,PRIC15,PRID15,PRIB16,PRIC16,PRID16,PRIB17,PRIC17,PRID17,	PIRC0290
4PRIF17,PRIC18,PRID18,PRIB19,PRIC19,PRID19,PRIB24,PRNB1,PRNC1,PRNB2,	PIRC0300
5,PRNC2,PRNB4,PRNC4,PRND4,PRNB5,PRNC5,PRNB9,PRNC9,PRND9,PRNE9,PRNF9,	PIRC0310
6,PRNB11,PRNC11,PRND11,PRNF11,PRNF11,PRNC12,PRND12,PRNB13,PRNC13,	PIRC0320
7PRND13,PRNB14,PRNC14,PRND14,PRNB15,PRNC15,PRND15,PRNB16,PRNC16,	PIRC0330
8PRND16,PRNB17,PRNC17,PRND17,PRNE17,PRNB20,PLB1,PLC1,PLA2,PLB2,PLB4,	PIRC0340
9,PLC4,PLA5,PLB5,PLB6,PLC6,PLA7,PLB7,PLB9,PLC9,PLA10,PLB10,PLA12,	PIRC0350
APLB12,PLB14,PLC14,PLC15,PLD15,PLB16,PLC16,PLD16,PLB19,PLC19,PTB1,	PIRC0360
PPTC1,PTA2,PTB2,PTA3,PTB3,PTC5,PTD5,PTB6,PTC6,PTD6,PTB8,PTC8,PEA1,	PIRC0370
CPE41,PEC1,PEA2,PEB2,PEC2,PEB4,PEC4,PED4,PEB5,PEC5,PEC5,PEE5,PEC6,	PIRC0380
DPED6,PEE7,PEC7,PED7,PEC11,PED11,PSA1,PSB1,PSC1,PSA2,PSB2,PSC2,PSB4,	PIRC0390
E,PSC4,PSD4,PSB5,PSC5,PSD5,PSE5,PSB6,PSC6,PSD6,PSE6,PSB7,PSC7,PSD7,	PIRC0400
FPSE7,PSC11,PSD11,PRND22,PLD21,PLE21,PTD10,PTD10,PRID26	PIRC0410
COMMON /COSTIN/ PROFIT,QD,R,AFA1,AFB1,AFC1,AFD1,AFI1,AFA2,AFB2,	PIRC0420
1AFG2,AFA3,AFB3,AFG3,AFA4,AFB4,AFC4,AFD4,AFJ4,AFA5,AFB5,AFC5,AFF5,	PIRC0430
2AFA6,AFB6,AFG6,AFA7,AFC7,AFD7,AFA8,AFF8,AFC8,AFD8,AFA9,AFF9,	PIRC0440
3AFC9,AFD9,AFF9,AFA10,AFB10,AFC10,AFF10,AFA11,AFF11,AFF11,AFA12,	PIRC0450
4AFC12,AFD12,AFA13,AFF13,AFC13,AFA14,AFF14,AFC14,KFUZE,WA1,WE1,WF1,	PIRC0460
5WA2,WD2,WF2,KGAIN,CA1,CF1,CF1,CA2,CE2,CF2,CA3,CE3,CF3,GA1,GB1,GF1,	PIRC0470
6KLE6,KGT6,KSTAB,KAGATE,NCHAN,KSGATE,GA2,GB2,GK2,GA3,GB3,GQ3,GA4,	PIRC0480
7GR4,CM4,GA5,GB5,GH5,KG,KC,KW,KA,KP,IGTYPE,ICTYPE,IPRST	PIRC0490
COMMON /COSTIN/ AFE1,AFF1,AFG1,AFH1,AFC2,AFD2,AFF2,AFF2,AFC3,	PIRC0500
1AFD3,AFF3,AFF3,AFF4,AFF4,AFG4,AFH4,AFI4,AFD5,AFF5,AFF5,AFF5,AFC6,	PIRC0510
2AFD6,AFF6,AFF6,AFF6,AFF8,AFF8,AFF8,AFF8,AFF9,AFF9,AFF9,AFF9,AFF9,	PIRC0520
3AFD10,AFF10,AFF10,AFG10,AFC11,AFD11,AFF11,AFF11,AFF12,WP1,WC1,WC1,	PIRC0530
4WB2,WC2,CB1,CC1,CD1,CB2,CC2,CD2,CB3,CC3,CD3,GC1,GD1,GE1,GC2,GD2,	PIRC0540
5CE2,GF2,GG2,GH2,GI2,GJ2,GC3,GD3,GE3,GF3,GG3,GH3,GI3,GJ3,GK3,GL3,	PIRC0550
	PIRC0560
	PIRC0570

6CM3,GN3,GP3,CC4,CD4,GE4,GF4,GG4,GH4,GI4,GJ4,GK4,GL4,GC5,GD5,GF5,	PIRC0580
7CF5,CG5,CFTTAB(11),PFTTAB(11)	PIRC0590
COMMON /CSTPRV/ CBLC,CBMC,CCASE,CCFU,CCL,CCM,CCCM1,CCOML,CCOMM,	PIRC0600
1 CCONT,CCRD,CBFU,CBRD,CETJ,CFXIN,CGFU,CGRD,	PIRC0610
2 CGT,CGTOT,CIGN,CIRJFU, CIRJRD, CLF,CLFL,CLGG,CLI,CLM,	PIRC0620
3 CLRFU,CLRRD,CLRT,CLTC,CLTP,CM,CMGG,CMH,CMTC,CMTF,	PIRC0630
4 CMV,CNOZ,CNRJFU, CNRJRD, CP,CPAFI,CPENG,CPL,CPLC,	PIRC0640
5 CPMFGL,CPMFGM,CPOA,CPR,CPRC,CPS,CPMGG,CPSN2,CPSRAM,CPSSGG,	PIRC0650
6 CPTOOL,CRAFI,CRDEV,CREG,CRENG,CRFTD,CRJC,CRMFGM,CRQA,	PIRC0660
7 CRTOOL,CSA,CSRUF,CSRDR,CSRT,CT,CTAFI,CTC,CTFB,CTIRJ,CTJFU,	PIRC0670
8 CTJLF,CTJLFL,CTJRD,CTJT, CTL,CTM,CTNRJ,CTP,CWH,CWHFU,CWHR,	PIRC0680
9 CBDDC,CRPS,CPUF,PROFPR,PRFUAF,PRRAF,CCLB,CCMB,CTCP,CLIB,CNOZB,	PIRC0690
A CPRB,CPLB,CIGNB,CSAB,PROFFX	PIRC0700
NAMLIST/ERRPRT/ CTL,CTM,CT,CEXIN,CGT,CREG,CMV,CPSN2,CPSSGG,	PIRC0710
1 CPMGG,CPSRAM,CLF,CLFL,CBLC,CBMC,CLI,CNOZ,CPRC,CPLC,CIGN,CSA,	PIRC0720
2 CBDDC,CIRJFU, CIRJRD,CTIRJ,CPS	PIRC0730
CFTU=CFTTAB(MATTK)	PIRC0740
PFTU=PFTTAB(MATTK)	PIRC0750
I=CASEM	PIRC0760
CFCASU=CFTTAB(I)	PIRC0770
PFCASU=PFTTAB(I)	PIRC0780
IF (CFT .NE. 0.) CFTU=CFT	PIRC0790
IF (PFT .NE. 0.) PFTU=PFT	PIRC0800
IF (CFCASE .NE. 0.) CFCASU=CFCASE	PIRC0810
IF (PFCASE .NE. 0.) PFCASU=PFCASE	PIRC0820
1 CTL=1.059*PRIA1*PRIB1*CFTU*WTANK**PRIC1	PIRC0830
2 CTM=1.059*PRIA2*PRIB2*PFTU*WTANK**PRIC2	PIRC0840
3 CT=PRIA3*(CTL+CTM)+PRIB3	PIRC0850
CEXIN = 0.0	PIRC0860
IF (VEXIN .EQ. C.0) GO TO 9991	PIRC0870
4 CEXIN=1.1*PRIA4*PRIB4*(PRIC4/VEXIN)**PRID4*VEXIN+PRIE4	PIRC0880
9991 CONTINUE	PIRC0890
IF(KFM.NE.1) GO TO 1000	PIRC0900
5 CCT=1.059*PRIA5*PRIB5*VRFQ**PRIC5/1000.	PIRC0910
6 CREG=PRIA6	PIRC0920
7 CMV=PRIA7	PIRC0930
8 CPSN2=PRIA8*(CGT+CREG+CMV)+PRIB8	PIRC0940
1000 IF(KFM.NE.3) GO TO 2000	PIRC0950
9 CPSSGG=1.1*PRIA9*PRIB9*(PRIC9*(PRID9/GGW)**PRIE9*GCW+PRIF9)+PRIG9	PIRC0960
2000 IF(KFM.NE.2) GO TO 3000	PIRC0970
10 CPMGG=PRIA10	PIRC0980
3000 IF(KFM.NE.4) GO TO 4000	PIRC0990
11 CPSRAM=1.1*PRIA11*(PRIB11*(PRIC11+PRID11*HPPUMP)-PRIE11*HPPUMP	PIRC1000
1 **PRIF11)+PRIG11	PIRC1010
4000 CONTINUE	PIRC1020
CPS=0.	PIRC1030
IF (KFM .EQ. 1) CPS=CPSN2	PIRC1040
IF (KFM .EQ. 2) CPS=CPMGG	PIRC1050
IF (KFM .EQ. 3) CPS=CPSSGG	PIRC1060
IF (KFM .EQ. 4) CPS=CPSRAM	PIRC1070
12 CLF=PRIA12*PRIB12*(PRIC12/WTUEL)**PRID12*WTUEL/1000.+PRIE12	PIRC1080
13 CLFL=1.1*PRIA13*PRIB13*(PRIC13/WTUEL)**PRID13*WTUEL+PRIE13	PIRC1090
14 CPLC=1.1*PRIA14*PRIB14*CFCASU*(PRIC14/WMC)**PRID14*WMC+PRIE14	PIRC1100
15 CBMC=1.1*PRIA15*PRIB15*PFCASU*(PRIC15/WMC)**PRID15*WMC+PRIF15	PIRC1110
16 CLI=1.1*PRIA16*PRIB16*(PRIC16/VBI)**PRID16*VBI+PRIE16	PIRC1120

17	CNOZ=1.1*PRIA17*PRIB17*(PRIC17+PRID17*2.*R5+PRIE17*Y1)*NOZWT	PIRC1130
1	+PRIF17	PIRC1140
18	CPRC=PRIA18*PRIB18/1000.*(PRIC18/MP)**PRID18*MP+PRIE18	PIRC1150
19	CPLC=1.1*PRIA19*PRIB19*(PRIC19/MP)**PRID19*MP+PRIE19	PIRC1160
20	CIGN=PRIA20	PIRC1170
21	CSA=PRIA21	PIRC1180
22	CBOOC=PRIA22*(CBLC+CBMC+CLI+CNOZ+CPRC+CPLC+CIGN+CSA)+PRIB22	PIRC1190
23	CIRJFU=PRIA23*(1.+PRJC)*(1.15*PRIB23*(CT+CFXIN+CPS+CLF+CLFL+CBOOC)	PIRC1200
1	+PRIC23)	PIRC1210
	CPFU=CIRJFU	PIRC1220
	PROFPR=CIRJFU*PRJC/(1.+PRJC)	PIRC1230
26	CIRJRD=(1.+PRJC)*PRIA26*(PRIB26*1.184*PRID26*DCOM+PRIC26)	PIRC1240
	CRPS=CIRJRD	PIRC1250
27	CTIRJ=CIRJFU+CIRJPD	PIRC1260
	CTL=CTL*PRIA23	PIRC1270
	CTM=CTM*PRIA23	PIRC1280
	CT=CT*PRIA23	PIRC1290
	CEXIN=CEXIN*PRIA23	PIRC1300
	CCT=CCT*PRIA23	PIRC1310
	CREG=CREG*PRIA23	PIRC1320
	CMV=CMV*PRIA23	PIRC1330
	CPSN2=CPSN2*PRIA23	PIRC1340
	CPSSGG=CPSSGG*PRIA23	PIRC1350
	CPSMGG=CPSMGG*PRIA23	PIRC1360
	CPSRAM=CPSRAM*PRIA23	PIRC1370
	CPS=CPS*PRIA23	PIRC1380
	CLF=CLF*PRIA23	PIRC1390
	CLFL=CLFL*PRIA23	PIRC1400
	CLC=CLC*PRIA23	PIRC1410
	CBMC=CBMC*PRIA23	PIRC1420
	CLI=CLI*PRIA23	PIRC1430
	CNOZ=CNOZ*PRIA23	PIRC1440
	CPRC=CPRC*PRIA23	PIRC1450
	CPLC=CPLC*PRIA23	PIRC1460
	CIGN=CIGN*PRIA23	PIRC1470
	CSA=CSA*PRIA23	PIRC1480
	CBOOC=CBOOC*PRIA23	PIRC1490
	IF (IPRCST.NE.0) WRITE (6,ERRPRT)	PIRC1500
	RETURN	PIRC1510
	END	PIRC1520

SUBROUTINE PNRCST

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NON-INTEGRAL RAMJET SUSTAINER PROPULSION COST

REAL NOZWT,MP	PNRC0010
COMMON /COMVLS/ WTANK,VEXIN,VREQ,GGW,HPPUMP,WTFUEL,WCOMM,VCCMI,	PNRC0020
1 P5,Y1,WNOZ,KFM,MATTK,A,DCOM,WMC,VBI,DTHRT,RNOZI,NCZWT,MP,CASEN,	PNRC0030
2 FNET,WT,WF,FMAX,S,T4,MET TJ,ZXNB,D,WP,FC,PPEAK,BSP,NDT,QA,WCS,	PNRC0040
3 WWH,WTC,WTP,WGG,WSC,WLV,VGT,WO,WP,DP,WN,METAL,NCONF	PNRC0050
COMMON /COSTIN/ PRIA1,PRIA2,PRJC,PRIA3,PRIB3,PRIA4,PRIE4,PRIA5,	PNRC0060
1PRIA6,PRIA7,PRIA8,PRIB8,PRIA9,PRIG9,PRIA10,PRIA11,PRIG11,PRIA12,	PNRC0070
2PRIB12,PRIE12,PRIA13,PRIE13,PRIA14,PRIE14,PRIA15,PRIE15,PRIA16,	PNRC0080
	PNRC0090
	PNRC0100
	PNRC0110
	PNRC0120

3PRIF16,PRIFA17,PRIF17,PRIA18,PRIB18,PRIE18,PRIA19,PRIE19,PRIA20,PNRC0130
 4PRIA21,PRIA22,PRIR22,PRIA23,PRIB23,PRIC23,PRIA24,PRIC24,PRIA25,PNRC0140
 5PRIB25,PRIA26,PRIR26,PRIC26,PRNA1,PRNA2,PRNA3,PRNB3,PRNA4,PRNE4,PNRC0150
 6PRNA5,PRNA6,PRNA7,PRNA8,PRNB8,PRNA9,PRNG9,PRNA10,PRNA11,PRNG11,PNRC0160
 7PRNA12,PRNB12,PRNE12,PRNA13,PRNE13,PRNA14,PRNE14,PRNA15,PRNA16,PNRC0170
 8PRNA17,PRNA18,PRNB18,PRNA19,PRNB19,PRNC19,PRNA20,PRNC20,PRNA21,PNRC0180
 9PRNB21,PRNA22,PRNB22,PRNC22,PLPC,PLA1,PLA3,PLB3,PLA4,PLA6,PLA8,PNRC0190
 APLB8,PLA9,PLA11,PLB11,PLA13,PLB13,PLC13,PLD13,PLA14,PLD14,PLA15,PNRC0200
 BPR15,PLE15,PLF15,PLA16,PLE16,PLA17,PLA18,PLB18,PLC18,PLA19,PLA20,PNRC0210
 CPLR20,PLA21,PLB21,PLC21,PTA1,PTA4,PTB4,PTA5,PTB5,PTA6,PTB6,PNRC0220
 CPTA7,PTB7,PTC7,PTJC,PTA8,PTD8,PTA9,PTB9,PTA10,PTB10,PTC10,PNRC0230
 EPEA3,PEB3,PEA4,PEE4,PEA5,PEF5,PEA6,PEB6,PEE6,PEA7,PEE7,PEA8,PEA9,PNRC0240
 FPFA10,PEB10,PEC10,PEA11,PEB11,PEE11,PEBC,PSPC,PSA3,PSB3,PSA4,PSE4,PNRC0250
 GPSA5,PSF5,PSA6,PSF6,PSG6,PSA7,PSF7,PSA8,PSA9,PSA10,PSB10,PSC10,PNRC0260
 HPSA11,PSR11,PSE11,CFT,PFT,CFCASE,PFCASE,CFC,PFC,CFM,PFM,IYEAR,PNRC0270
 COMMON /COSTIN/ PRIB1,PRIC1,PRIB2,PRIC2,PRIB4,PRIC4,PRID4,PRIB5,PNRC0280
 1PRIC5,PRIB9,PRIC5,PRID5,PRIE9,PRIF9,PRIB11,PRIC11,PRID11,PRIE11,PNRC0290
 2PRIF11,PRIC12,PRID12,PRIB13,PRIC13,PRID13,PRIB14,PRIC14,PRID14,PNRC0300
 3PRIB15,PRIC15,PRID15,PRIB16,PRIC16,PRID16,PRIB17,PRIC17,PRID17,PNRC0310
 4PRIF17,PRIC18,PRID18,PRIB19,PRIC19,PRID19,PRIB24,PRNB1,PRNC1,PRNB2,PNRC0320
 5,PRNC2,PRNB4,PRNC4,PRND4,PRNB5,PRNC5,PRNB9,PRNC9,PRND9,PRNE9,PRNF9,PNRC0330
 6,PRNB11,PRNC11,PRND11,PRNE11,PRNF11,PRNC12,PRND12,PRNB13,PRNC13,PNRC0340
 7PRND13,PRNB14,PRNC14,PRND14,PRNB15,PRNC15,PRND15,PRNB16,PRNC16,PNRC0350
 8PRND16,PRNB17,PRNC17,PRND17,PRNE17,PRNB20,PLB1,PLC1,PLA2,PLB2,PLB4,PNRC0360
 9,PLC4,PLA5,PLB5,PLB6,PLC6,PLA7,PLB7,PLB9,PLC9,PLA10,PLB10,PLA12,PNRC0370
 APLB12,PLB14,PLC14,PLC15,PLD15,PLB16,PLC16,PLD16,PLB19,PLC19,PTB1,PNRC0380
 PPTC1,PTA2,PTB2,PTA3,PTB3,PTC5,PTD5,PTB6,PTC6,PTD6,PTB8,PTC8,PEA1,PNRC0390
 CPER1,PEC1,PEA2,PEB2,PEC2,PEB4,PEC4,PEB5,PEC5,PEC6,PEE5,PEC6,PNRC0400
 DPEB6,PEB7,PEC7,PEB7,PEC11,PEB11,PSA1,PSB1,PSA2,PSB2,PSA3,PSB4,PNRC0410
 E,PSA4,PSB4,PSA5,PSB5,PSA6,PSB6,PSA7,PSB7,PSA8,PSB8,PSA9,PSB9,PNRC0420
 FPSE7,PSA11,PSD11,PRND22,PLD21,PLE21,PTD10,PTD10,PTD10,PRID26,PNRC0430
 COMMON /COSTIN/ PROFIT,QD,R,AFA1,AFB1,AFC1,AFD1,AFI1,AFA2,AFB2,PNRC0440
 1AFG2,AFA3,AFB3,AFG3,AFA4,AFB4,AFC4,AFD4,AFJ4,AFA5,AFB5,AFC5,AFH5,PNRC0450
 2AFA6,AFB6,AFG6,AFA7,AFC7,AFD7,AFA8,AFB8,AFC8,AFD8,AFI8,AFA9,AFB9,PNRC0460
 3AFC9,AFD9,AFJ9,AFA10,AFB10,AFC10,AFH10,AFA11,AFB11,AFG11,AFA12,PNRC0470
 4AFC12,AFD12,AFA13,AFB13,AFC13,AFA14,AFB14,AFC14,KFUZE,WA1,WE1,WF1,PNRC0480
 5WA2,WD2,WE2,KGAIN,CA1,CF1,CF1,CA2,CE2,CF2,CA3,CE3,CF3,GA1,GB1,GF1,PNRC0490
 6KIF6,KGT6,KSTAB,KAGATE,NCHAN,KSGATE,GA2,GB2,GK2,GA3,GB3,GQ3,GA4,PNRC0500
 7CB4,CM4,GA5,GB5,GH5,KG,KC,KW,KA,KP,IGTYPE,ICTYPE,IPOST,PNRC0510
 COMMON /COSTIN/ AFE1,AFE1,AFH1,AFC2,AFD2,AFE2,AFE2,AFE2,AFE2,PNRC0520
 1AFD3,AFE3,AFE3,AFE4,AFE4,AFG4,AFH4,AFI4,AFD5,AFE5,AFE5,AFG5,AFC6,PNRC0530
 2AFD6,AFE6,AFE6,AFB7,AFE8,AFE8,AFG8,AFH8,AFE9,AFE9,AFG9,AFH9,AFI9,PNRC0540
 3AFD10,AFE10,AFE10,AFG10,AFC11,AFD11,AFE11,AFE11,AFI12,WE1,WC1,WC1,PNRC0550
 4WR2,WC2,CB1,CC1,CD1,CB2,CC2,CD2,CB3,CC3,CD3,GC1,GD1,GE1,GC2,GD2,PNRC0560
 5CE2,GF2,GG2,GH2,GI2,GJ2,GC3,GD3,GE3,GF3,GG3,GH3,GI3,GJ3,GK3,GL3,PNRC0570
 6CM3,GN3,GP3,GC4,GD4,GE4,GF4,GG4,GH4,GI4,GJ4,GK4,GL4,GC5,GD5,GF5,PNRC0580
 7CF5,GG5,CFTTAB(11),PFTTAB(11),PNRC0590
 COMMON /CSTPRV/ CRLC,CBMC,CCASE,CCFU,CCL,CCM,CCOMI,CCOML,CCOMM,PNRC0600
 1 CCONT,CCRD,CEBFU,CEBRD,CETJ,CEXIN,CGFU,CGRD,PNRC0610
 2 CGT,CGTOT,CIGN,CIRJFU,CIRJRD,CLF,CLFL,CLGG,CLI,CLM,PNRC0620
 3 CLRJFU,CLRRD,CLRT,CLTC,CLTP,CM,CMGG,CMF,CMTC,CMTP,PNRC0630
 4 CMV,CNOZ,CNRJFU,CNRJRD,CP,CPAFI,CPENG,CPL,CPLC,PNRC0640
 5 CPMFGL,CPMFGM,CPOA,CPR,CPRC,CPS,CPSMG,CPSN2,CPSRAM,CPSGG,PNRC0650
 6 CPTOOL,CRAFI,CRDEV,CREG,CRENG,CREFTO,CRJC,CRMFG,CRMFGM,CROA,PNRC0660
 7 CRTOOL,CSA,CSR FU,CSRRD,CST,CT,CTAFI,CTC,CTEB,CTIRJ,CTJFU,PNRC0670

8	CTJLF,CTJLFL,CTJPD,CTJT,	CTL,CTM,CTNRJ,CTP,CWH,CWHFU,CWHR,	PNRC0680
9	CRQOC,CRPS,CPFU,PROFPR,PRFUAF,PRRAF,CCLB,CCMB,CTCB,CLIB,CNOZ,		PNRC0690
A	CPKB,CPLB,CIGNB,CSAB,PROFEX		PNRC0700
	NAMFLIST /FRRPT/ CTL,CTM,CT,CEXIN,CGT,CREG,CMV,CPSN2,CPSSGG,		PNRC0710
1	CPSMGG,CPGRAM,CLF,CLFL,CCOML,CCOMM,CCOMI,CNOZ,CRJC,CNRJFU,		PNRC0720
2	CNRJRD,CTNRJ,CPS		PNRC0730
	CFTU=CFTTAB(MATTK)		PNRC0740
	PFTU=PFTTAB(MATTK)		PNRC0750
	I=CASEM		PNRC0760
	CFCU=CFTTAB(I)		PNRC0770
	PFCU=PFTTAB(I)		PNRC0780
	IF (CFT .NE. 0.) CFTU=CFT		PNRC0790
	IF (PFT .NE. 0.) PFTU=PFT		PNRC0800
	IF (CFC .NE. 0.) CFCU=CFC		PNRC0810
	IF (PFC .NE. 0.) PFCU=PFC		PNRC0820
1	CTL=1.059*PRNA1*PRNB1*CFTU*WTANK**PRNC1		PNRC0830
2	CTM=1.059*PRNA2*PRNB2*PFTU*WTANK**PRNC2		PNRC0840
3	CT=PRNA3*(CTL+CTM)+PRNB3		PNRC0850
	CEXIN = 0.0		PNRC0860
	IF (VEXIN .EQ. 0.0) GO TO 9991		PNRC0870
4	CEXIN=1.1*PRNA4*PRNB4*(PRNC4/VEXIN)**PRND4*VEXIN+PRNF4		PNRC0880
9991	CONTINUE		PNRC0890
	IF(KFM.NE.1) GO TO 1000		PNRC0900
5	CGT=1.059*PRNA5*PRNB5*VREQ**PRNC5/1000.		PNRC0910
6	CREG=PRNA6		PNRC0920
7	CMV=PRNA7		PNRC0930
8	CPSN2=PRNA8*(CGT+CREG+CMV)+PRNB8		PNRC0940
1000	IF(KFM.NE.3) GO TO 2000		PNRC0950
9	CPSSGG=1.1*PRNA9*PRNB9*(PRNC9*(PRND9/GGW)**PRNE9*GGW+PRNF9)+PRNG9		PNRC0960
2000	IF(KFM.NE.2) GO TO 3000		PNRC0970
10	CPSMGG=PRNA10		PNRC0980
3000	IF(KFM.NE.4) GO TO 4000		PNRC0990
11	CPGRAM=1.1*PRNA11*(PRNB11*(PRNC11+PRND11*HPPUMP)-PRNE11*HPPUMP		PNRC1000
1	**PRNF11)+PRNG11		PNRC1010
4000	CONTINUE		PNRC1020
	CPS=0.		PNRC1030
	IF (KFM .EQ. 1) CPS=CPSN2		PNRC1040
	IF (KFM .EQ. 2) CPS=CPSSGG		PNRC1050
	IF (KFM .EQ. 3) CPS=CPSSGG		PNRC1060
	IF (KFM .EQ. 4) CPS=CPGRAM		PNRC1070
12	CLF=PRNA12*PRNB12*(PRNC12/WTFUEL)**PRND12*WTFUEL/1000.+PRNE12		PNRC1080
13	CLFL=1.1*PRNA13*PRNB13*(PRNC13/WTFUEL)**PRND13*WTFUEL+PRNE13		PNRC1090
14	CCOML=PRNA14*PRNB14*1.1*CFCU*(PRNC14/WCOMM)**PRND14*WCOMM		PNRC1100
15	CCOMM=1.1*PRNA15*PRNB15*PFCU*(PRNC15/WCOMM)**PRND15*WCOMM		PNRC1110
16	CCOMI=1.1*PRNA16*PRNB16*(PRNC16/VCOMI)**PRND16*VCOMI		PNRC1120
17	CNOZ=1.1*PRNA17*PRNB17*(PRNC17+PRND17*R5+PRNE17*Y1)*WNOZ		PNRC1130
18	CRJC=PRNA18*(CCOML+CCOMM+CCOMI+CNOZ)+PRNB18		PNRC1140
19	CNRJFU=PRNA19*(1.+PRJC)*(1.15*PRNB19*(CT+CEXIN+CPS+CLF+CLFL+CRJC)		PNRC1150
1	+PRNC19)		PNRC1160
	CPFU=CNRJFU		PNRC1170
	PROFPR=CNRJFU*PRJC/(1.+PRJC)		PNRC1180
22	CNRJRD=(1.+PRJC)*PRNA22*(PRNB22*1.184*PRND22*DCOM+PRNC22)		PNRC1190
	CRPS=CNRJRD		PNRC1200
23	CTNRJ=CNRJFU+CNRJRD		PNRC1210
	CTL=CTL*PRNA19		PNRC1220

CT=CT*PRNA19	PNRC1230
CFXIN=CEXIN*PRNA19	PNRC1240
CCT=CGT*PRNA19	PNRC1250
CRFG=CRFG*PRNA19	PNRC1260
CMV=CMV*PRNA19	PNRC1270
CPSN2=CPSN2*PRNA19	PNRC1280
CPSSGG=CPSSGG*PRNA19	PNRC1290
CPSMGG=CPSMGG*PRNA19	PNRC1300
CPSRAM=CPSRAM*PRNA19	PNRC1310
CPS=CPS*PRNA19	PNRC1320
CLF=CLF*PRNA19	PNRC1330
CLFL=CLFL*PRNA19	PNRC1340
CCOML=CCOML*PRNA19	PNRC1350
CCOMM=CCOMM*PRNA19	PNRC1360
CCOMI=CCOMI*PRNA19	PNRC1370
CNOZ=CNOZ*PRNA19	PNRC1380
CPJC=CPJC*PRNA19	PNRC1390
IF (IPRST.NE.C) WRITE (6,ERRPRT)	PNRC1400
RETURN	PNRC1410
END	PNRC1420

SUBROUTINE PTJCST

TURBOJET PROPULSION COST

REAL NOZWT,MP	PTJC0010
COMMON /ZJVL S/ WTANK,VE XIN,VREQ,GGW,IPPUMP,WFJFL,WCOMM,VCOMI,	PTJC0020
1 R5,Y1,WNOZ,KFM,MATTK,A,DCOM,WMC,VBI,DTHRT,RNOZI,NCZWT,MP,CASEM,	PTJC0030
2 FNET,WT,WF,FMAX,S,T4,METTJ,ZXNB,D,WM,FC,PPEAK,BSP,ADET,QA,WCS,	PTJC0040
3 WWH,WTC,WTP,WGG,WSC,WLV,VT,WO,WP,DP,WN,METAL,NCCNFG	PTJC0050
COMMON /COSTIN/ PRIA1,PRIA2,PRJC,PRIA3,PRIB3,PRIA4,PRIE4,PRI45,	PTJC0060
1PRIA6,PRIA7,PRIA8,PRIB8,PRIA9,PRIG9,PRIA10,PRIA11,PRIG11,PRIA12,	PTJC0070
2PRIB12,PRIE12,PRIA13,PRIE13,PRIA14,PRIE14,PRIA15,PRIE15,PRIA16,	PTJC0080
3PRIF16,PRIA17,PRIF17,PRIA18,PRIB18,PRIE18,PRIA19,PRIE19,PRIA20,	PTJC0090
4PRIA21,PRIA22,PRIB22,PRIA23,PRIB23,PRIC23,PRIA24,PRIC24,PRIA25,	PTJC0100
5PRIB25,PRIA26,PRIB26,PRIC26,PRNA1,PRNA2,PRNA3,PRNB3,PRNA4,PRNE4,	PTJC0110
6PRNA5,PRNA6,PRNA7,PRNA8,PRNB8,PRNA9,PRNG9,PRNA10,PRNA11,PRNG11,	PTJC0120
7PRNA12,PRNB12,PRNE12,PRNA13,PRNE13,PRNA14,PRNE14,PRNA15,PRNA16,	PTJC0130
8PRNA17,PRNA18,PRNB18,PRNA19,PRNB19,PRNC19,PRNA20,PRNC20,PRNA21,	PTJC0140
9PRNB21,PRNA22,PRNB22,PRNC22,PLPC,PLA1,PLA3,PLB3,PLA4,PLA6,PLA8,	PTJC0150
APLB8,PLA9,PLA11,PLB11,PLA13,PLB13,PLC13,PLD13,PLA14,PLD14,PLA15,	PTJC0160
PPLB15,PLF15,PLF15,PLA16,PLE16,PLA17,PLA18,PLB18,PLC18,PLA19,PLA20,	PTJC0170
CPLB20,PLA21,PLB21,PLC21,PTA1,PTD1,PTA4,PTB4,PTA5,PTB5,PTA6,	PTJC0180
CPTE6,PTA7,PTB7,PTC7,PTJC,PTA8,PTD8,PTA9,PTB9,PTA10,PTB10,PTC10,	PTJC0190
EPFA3,PEF3,PFA4,PEF4,PEA5,PEF5,PEA6,PEB6,PEE6,PEA7,PEF7,PEA8,PEA9,	PTJC0200
FPEA10,PER10,PEC10,PEA11,PEB11,PEE11,PEBC,PSPC,PSA3,PSB3,PSA4,PSE4,	PTJC0210
GPSA5,PSF5,PSA6,PSF6,PSG6,PSA7,PSF7,PSA8,PSA9,PSA10,PSB10,PSC10,	PTJC0220
HPSA11,PSB11,PSF11,CFT,PFT,CFCASE,PFCASE,CFC,PFC,CFM,PFM,IYEAR	PTJC0230
COMMON /COSTIN/ PRIB1,PRIC1,PRIB2,PRIC2,PRIB4,PRIC4,PRID4,PRIE5,	PTJC0240
1PRIC5,PRIB9,PRIC5,PRID5,PRIE9,PRIF9,PRIB11,PRIC11,PRID11,PRIE11,	PTJC0250
2PRIF11,PRIC12,PRID12,PRIB13,PRIC13,PRID13,PRIB14,PRIC14,PRID14,	PTJC0260
3PRIB15,PRIC15,PRID15,PRIB16,PRIC16,PRID16,PRIB17,PRIC17,PRID17,	PTJC0270
4PRIF17,PRIC18,PRID18,PRIB19,PRIC19,PRID19,PRIB24,PRNE1,PRNC1,PRNB2	PTJC0280
	PTJC0290
	PTJC0300
	PTJC0310
	PTJC0320

5, PRNC2, PRNB4, PRNC4, PRND4, PRNB5, PRNC5, PRNB9, PRNC9, PRNE9, PRNF9 PT JC0330
6, PRNB11, PRNC11, PRND11, PRNE11, PRNF11, PRNC12, PRND12, PRNB13, PRNC13, PT JC0340
7 PRND13, PRNB14, PRNC14, PRND14, PRNB15, PRNC15, PRND15, PRNB16, PRNC16, PT JC0350
8 PRND16, PRNB17, PRNC17, PRND17, PRNF17, PRNB20, PLB1, PLC1, PLA2, PLB2, PLR4 PT JC0360
9, PLC4, PLA5, PLB5, PLB6, PLC6, PLA7, PLB7, PLB9, PLC9, PLA10, PLB10, PLA12, PT JC0370
APLB12, PLR14, PLC14, PLC15, PLD15, PLB16, PLC16, PLD16, PLR19, PLC19, PTB1, PT JC0380
BPTC1, PTA2, PTB2, PTA3, PTB3, PTC5, PTD5, PTB6, PTC6, PTD6, PTB8, PTC8, PEAL, PT JC0390
CPEB1, PEC1, PFA2, PEB2, PEC2, PEB4, PFC4, PED4, PEB5, PEC5, PED5, PEE5, PEC6, PT JC0400
CPED6, PER7, PEC7, PED7, PEC11, PED11, PSA1, PSB1, PSC1, PSA2, PSB2, PSC2, PSR4 PT JC0410
F, PSC4, PSD4, PSB5, PSC5, PSD5, PSE5, PSB6, PSC6, PSD6, PSE6, PSB7, PSC7, PSC7, PT JC0420
FPSE7, PSC11, PSD11, PRND22, PLD21, PLE21, PTD10, PTE10, PRID26 PT JC0430
COMMON /COSTIN/ PROFIT, QD, R, AFA1, AFB1, AFC1, AFD1, AF11, AFA2, AFB2, PT JC0440
1 AFG2, AFA3, AFB3, AFG3, AFA4, AFB4, AFC4, AFD4, AFJ4, AFA5, AFR5, AFC5, AFH5, PT JC0450
2 AFA6, AFB6, AFG6, AFA7, AFC7, AFD7, AFA8, AFR8, AFC8, AFD8, AF18, AFA9, AFR9, PT JC0460
3 AFC9, AFD9, AFJ9, AFA10, AFB10, AFC10, AFH10, AFA11, AFB11, AFG11, AFA12, PT JC0470
4 AFC12, AFD12, AFA13, AFB13, AFC13, AFA14, AFB14, AFC14, KFUZE, WA1, WE1, WF1, PT JC0480
5 WA2, WD2, WE2, KGAIN, CA1, CE1, CF1, CA2, CE2, CF2, CA3, CF3, CF3, GA1, GB1, GF1, PT JC0490
6 KLF6, KGT6, KSTAR, KAGATE, NCHAN, KSGATE, GA2, GB2, GK2, GA3, GB3, GQ3, GA4, PT JC0500
7 GP4, GM4, GA5, GB5, GH5, KG, KC, KW, KA, KP, IGTYP, ICTYPE, IPRCST PT JC0510
COMMON /COSTIN/ AFE1, AFF1, AFG1, AFH1, AFC2, AFD2, AFE2, AFF2, AFC3, PT JC0520
1 AFD3, AFF3, AFF3, AFF4, AFF4, AFG4, AFH4, AF14, AFD5, AFE5, AFF5, AFG5, AFC6, PT JC0530
2 AFD6, AFE6, AFF6, AFB7, AFE8, AFF8, AFG8, AFH8, AFE9, AFF9, AFG9, AFH9, AF19, PT JC0540
3 AFD10, AFE10, AFF10, AFG10, AFC11, AFD11, AFE11, AFF11, AFB12, WB1, WC1, WD1, PT JC0550
4 WP2, WC2, CB1, CC1, CD1, CB2, CC2, CD2, CB3, CC3, CD3, GC1, GD1, GE1, GC2, GD2, PT JC0560
5 GF2, CF2, GG2, GH2, GI2, GJ2, GC3, GD3, GE3, GF3, GG3, GH3, GI3, GJ3, GK3, GL3, PT JC0570
6 CM3, GN3, GP3, GC4, GD4, GE4, GF4, GG4, GH4, GI4, GJ4, GK4, GL4, GC5, GD5, GE5, PT JC0580
7 GF5, GG5, CFTTAB(11), PFTTAB(11) PT JC0590
COMMON /CSTPRV/ CBLC, CBMC, CCASE, CCFU, CCL, CCM, CCOMI, CCCML, CCOMM, PT JC0600
1 CCONT, CCRD, CERFU, CERRD, CETJ, CEXIN, CGFU, CGRD, PT JC0610
2 CGT, CGTOT, CIGN, CIRJFU, CIRJRD, CLF, CLFL, CLGG, CLI, CLM, PT JC0620
3 CLRFU, CLRRD, CLRT, CLTC, CLTP, CM, CMGG, CMM, CMT, CMT, PT JC0630
4 CMV, CNOZ, CNRJFU, CNRJR, CP, CPAFI, CPENG, CPL, CPLC, PT JC0640
5 CPMFGL, CPMFGM, CPQA, CPR, CPRC, CPS, CPSMGG, CPSN2, CPSRAM, CPSSGG, PT JC0650
6 CPTOOL, CRAFI, CRDEV, CREG, CRENG, CRFTD, CRJC, CRMFGL, CRMFGM, CRQA, PT JC0660
7 CRTOOL, CSA, CSRFU, CSRPRD, CSRT, CT, CTAFI, CTC, CTB, CTIRJ, CTJFU, PT JC0670
8 CTJLF, CTJLFL, CTJRD, CTJT, CTL, CTM, CTNRJ, CTP, CWH, CWHFU, CWHF, PT JC0680
9 CBDDC, CRPS, CPFU, PROEPR, PRFUAF, PRRAF, CCLB, CCMB, CTCB, CLIB, CNCZR, PT JC0690
A CPRB, CPLB, CIGNB, CSAB, PROFFX PT JC0700
DIMENSION CFTARY(3), PFTARY(3) PT JC0710
NAMELIST /ERRPRT/ CETJ, CTL, CTM, CT, CTJLF, CTJLFL, CTJFU, PT JC0720
1 CTJRD, CTJT PT JC0730
DATA CFTARY/.2, 1., 1./ PT JC0740
DATA PFTARY/.257, 2.571, 1./ PT JC0750
CFTU=CFTARY(METTJ) PT JC0760
PFTU=PFTARY(METTJ) PT JC0770
PTRIU=1.52 PT JC0780
PTCIU=.6 PT JC0790
IF (T4 .GE. 2060.) PTB1U=3.08 PT JC0800
IF (T4 .GT. 2360.) PTB1U=5.64 PT JC0810
IF (CFT .NE. 0.) CFTU=CFT PT JC0820
IF (PFT .NE. 0.) PFTU=PFT PT JC0830
IF (PTB1 .NE. 0.) PTRIU=PTB1 PT JC0840
IF (PTC1 .NE. 0.) PTCIU=PTC1 PT JC0850
1 CFTJ=PTA1*PTB1U*FNET**PTCIU*1.222+PTD1 PT JC0860
2 CTL=1.059*PTA2*CFTU*WT**PTB2 PT JC0870

3	CTM=1.059*PTA3*PFTU*WT**PTR3	PTJC0880
4	CT=PTA4*(CTL+CTM)+PTR4	PTJC0890
5	CTJLF=PTA5*PTR5*(PTC5/WF)**PTD5*WF/1000.+PTE5	PTJC0900
6	CTJLFL=1.1*PTA6*PTR6*(PTC6/WF)**PTD6*WF+PTE6	PTJC0910
7	CTJFU=PTA7*(1.+PTJC)*(1.15*PTR7*(CETJ+CT+CTJLF+CTJLFL)+PTC7)	PTJC0920
	CPFU=CTJFU	PTJC0930
	PROFPR=CTJFU*PTJC/(1.+PTJC)	PTJC0940
10	CTJRD=PTA10*(PTR10*1.462*PTD10*FMAX**PTE10+PTC10)*(1.+PTJC)	PTJC0950
	CRPS=CTJRD	PTJC0960
11	CTJT=CTJFU+CTJRD	PTJC0970
	CETJ=CETJ*PTA7	PTJC0980
	CTL=CTL*PTA7	PTJC0990
	CTM=CTM*PTA7	PTJC1000
	CT=CT*PTA7	PTJC1010
	CTJLF=CTJLF*PTA7	PTJC1020
	CTJLFL=CTJLFL*PTA7	PTJC1030
	IF (IPRCST.NE.0) WRITE (6,ERRPRT)	PTJC1040
	RETURN	PTJC1050
	END	PTJC1060

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*DATA 2	Utility	HA-28
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